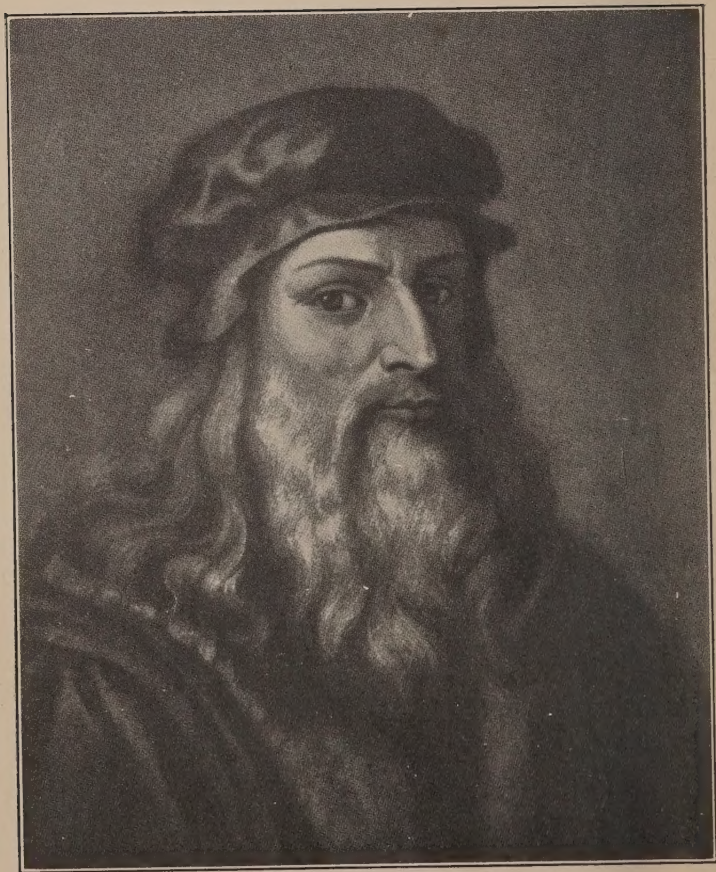




LEONARDO DA VINCI.

What Civilization Owes to Italy

By

JAMES J. WALSH, M. D., PH. D., SC. D., ETC.

Extension Professor Fordham University, Professor of Physiological Psychology at the Cathedral College and College of the Sacred Heart (Manhattanville) New York City, Lecturer on Psychology and Sociology at St. Mary's College, Plainfield, N. J., and Marywood College, Scranton, Pa. Author of The Thirteenth Greatest of Centuries, The Century of Columbus, Makers of Modern Medicine, Health Through Will Power, Religion and Health, etc.



1923

THE STRATFORD COMPANY, PUBLISHERS

Boston, Massachusetts

Copyright, 1923
The STRATFORD CO., Publishers
Boston, Mass.

The Alpine Press, Boston, Mass., U. S. A.

To

THE MOST REVEREND JOHN BONZANO
Apostolic Delegate to the United States,
in esteem and appreciation

Contents

	Page
Preface	i
Introduction	v
Architecture	34
Arts and Crafts	60
Astronomy	214
Biological Sciences	238
Discoverers and Explorers	379
Education	97
Feminine Education	118
Great Women of Italy	333
Inventions	398
Italian Cities	359
Italian Scholarship	134
Law	185
Literature	76
Mathematics	102
Medicine	263
Men of World Influence	308
Music	46
Painting	1
Philosophy	164
Physical Science	225
Sculpture	22
Surgery	288

List of Illustrations

Leonardo da Vinci	<i>Frontispiece</i>
	Opp.
	Page
Raphael	xi
Entrance, Palazzo Publico, Perugia, Italy	3
Raising of Lazarus (Giotto)	11
St. Peter's Rome	40
Singing Boys (Donatello 1386-1466)	68
Titian, Emperor Charles V	74
Palma Vecchio, Poet (Sometimes called Ariosto)	90
Cathedral, Milan, Italy	111
Raphael, Pope Julius II	141
Leonardo da Vinci, Madonna of the Rocks (London)	152
Singing Gallery of the Cathedral (Lucca Della Robbia 1400-1482)	177
Correggio	193
Grand Canal with Cavalli Palace, Venice	212
Cathedral, Baptistry, and Leaning Tower, Pisa	231
Bellini Doge Loredano	246
Girolamo Fracastoro (1484-1553)	273
Bellini	275
Sanctorius on the Steelyard	280
Verrocchio Colleoni	294
Christ (Michelangelo)	313
Filippino Lippi, Madona with four Saints	327
Pietà (Michelangelo)	349
Bronze Horses, St. Mark's, Venice	359
Bronze Door, Baptistry, Florence	362
Tomb of Dante, Ravenna, Italy	374
Amerigo Vespucci	379
Fortitude, Truth and Temperance (Raffael in Vatican)	398

Preface

BEFORE the Great War came to give us a series of disillusionments with regard to our modern civilization, nearly all the world was agreed in thinking that material prosperity was the certain index of a nation's greatness. Governments were committed to the policy that a nation's place in civilization was measured by its bank clearances. The happiness of a people depended on the multiplication of its comforts and conveniences. The ideal of life was not to make people happy, but to make them comfortable. Apparently many people seemed to think that the two terms were convertible, though nothing could possibly be less true than that. There was a definite persuasion that if we created great leisure classes in the various countries they would surely devote themselves to the higher things of life and if not by actual creation, at least through discriminating appreciation, foster art and literature and the cult of the things of the mind which make for the real uplift of humanity.

Occupied with this thought the world for several generations has given itself up to the idea that the struggle for material existence, carried out to the fullest extent would surely bring with it the evolution of the race, and in the course of progress the fittest would survive and humanity would rise on stepping stones of its dead self to higher things. The awful war, the most destructive that humanity has ever had has wakened most of us up to the fallacy of this notion, and has made at least those who think seriously about the question realize that over occupation of men with the material side of life always works out its own destruction, and that the

one hope of mankind is to secure as much interest as possible in the things of the mind and heart and soul rather than of the body.

One of our American poets told us that "the dreamer lives forever and the toiler dies in a day." The expression is almost commonplace in the mouths of those who have studied the history of mankind deeply. Most people felt, however, that this contained more poetry than truth and was scarcely to be taken very seriously, but the war has shown us very clearly how the toilers who take their toil too seriously work out their own destruction and disappear in their own little day. Only those nations have lived in the memory of men who have devoted themselves to the things of the mind and heart and soul rather than of the body, who have given themselves to the cult of mental and artistic development rather than material prosperity or commercial evolution.

Probably in nothing is this great lesson of history better illustrated than in the story of Italy. All down the centuries in modern times the Italian peninsula has been the scene of civic dissensions and endless conflicts between the many petty rulers who have governed various portions of it. There has never been, until the last generation, anything like union into a single great state that might look for prosperity in the modern competitive sense, yet in spite of political division which prevented national prosperity, Italy has given the world more that "the world will never willingly let die," to use Milton's noble phrase, than any other nation in Europe. The debt of civilization to Italy is so great as to be almost incomputable.

Now that the rising generation has to form anew its ideas as to what constitutes the greatness of a nation there could probably be no more precious lesson than the story of what civilization owes to Italy. It is quite literally the success of failure. Italy was never a great, prosperous nation. It comprised a people struggling to express the meaning of life, as it appealed to it, in art and literature, in music and architecture, and its dreamers live on as the toilers do not.

PREFACE

In the time to come the nations are going to be judged by the generations which succeed them all over the world, just in proportion as they rival Italy's achievements in art and literature, and the creation of the things of beauty that are a joy forever, rather than in the accumulation of wealth and the piling up of material monuments to successful bodily effort..

Tyre and Sidon and Babylon and Carthage have disappeared completely after the production of magnificent material results, while the art and literature of Egypt and Greece and Rome are still living forces in the world, and what the Italians have done for civilization will endure to be a priceless heritage for mankind, a living source of incentive for the race when the material achievements of the prosperous nations will have disappeared, or been so eclipsed by time that they will be scarcely more than an antiquarian memory.

Introduction

FOR the past five hundred years practically everyone possessed of any intellectual curiosity, who could possibly secure the opportunity has made a visit of greater or less length to Italy. Surely every visitor who heard the legend that anyone who threw a copper into the Fontana Trevi before leaving Rome was sure to come back sooner or later to that center of history, has yielded to the temptation and tossed his coin into the clear water, even though he might suspect that the tradition was only a nice little scheme to increase the meagre wages of the fountain cleaners. Every visitor to Italy who could, has returned once or oftener to the peninsula in the fullest persuasion that a tour in that country represented one of the most important influences in modern life for the development of mind and taste. Jocelyn of Brakeland's visit to Italy in the thirteenth century so vividly described by Carlyle, was only a type of what had happened all during the middle ages when in spite of distance and dangers and hardships and trials of all kinds, men of intellectual ambition made their way down to Italy. In the Renaissance time great intellectual leaders like Bishop Warham and Dr. Caius, the founder of Caius College, Cambridge, went down from distant England just as so many did from Spain and France, and still others like Nicholas of Cusa and Copernicus and Regiomontanus and Reuchlin from Germany and Vesalius the Father of Anatomy from the Netherlands. In the early seventeenth century Milton visited Italy and tells proudly of his welcome there, but so did Steno the Danish professor of anatomy whose name is attached

INTRODUCTION

forever to some discoveries and Harvey, the great discoverer of the circulation of the blood who cordially acknowledged his obligations to his Italian teachers. What they did everyone else who could in their time did.

In the eighteenth and early nineteenth centuries the grand tour of the continent, as it was called, came to be looked upon as a culmination of education that no one with any pretence to culture could afford to miss. It always included a stay for a longer time in Italy than anywhere else and the higher the intellectual taste of the tourist the lengthier his Italian travel as a rule. There has been a flood of tourist travel into Italy in the later nineteenth and twentieth centuries to such an extent that foreign tourists have been worth more in money value to the Italians than successful factories to most other countries, but without the blackening of the landscape and crowded slums near the factories that so often go with them. People of all classes have gone from all over the world. Some of them have derived little benefit from it for Italy rewards all only in proportion to what they bring to it, but most of them have felt after their return that their visits to Italy was one of the most precious experiences of their mental development.

Cultured people of all types feel that their lives are incomplete without a visit to Italy. Those whose education has been founded on the classics go with the feeling that the actual sight of the remains of Italy will make the history of Rome, not only the city but the empire, a great living phase of their mental life instead of merely the dry bones of information. Men interested in art, but above all artists themselves, feel that there is no place in the world to which a visit means so much for the development of artistic taste and a proper appreciation of art as Italy. Architects go down there with the enthusiastic conviction that no where in the world can so many different styles of original work in architecture or so many eminently suggestive monuments of construction be studied as in the various Italian cities. Painters expect to find an inspiration to what is best and

truest in art, but so do those who are interested in the arts and crafts, for Italy is a veritable treasure house of things of beauty, that are a joy forever in the home, in the nobleman's palace, in public buildings and above all in the service of the worship of the Creator. Beautiful furniture, exquisite lace and handsome vestments, textiles, smaller bronzes and marbles of all kinds, exquisite illuminated books as well as paintings and sculpture of artistic quality, have been finding their way out of Italy in recent years in spite of government regulations to the contrary to be sold in our auction rooms at prices which only the very wealthy can afford to give.

Notwithstanding all this quite frank recognition of Italy's possession of magnificent treasures of art, greater than are to be seen anywhere else, all of them the products of genius native to the soil, comparatively few people appreciate how immense is the debt which civilization owes to Italy. The artist is the flower of our civilization, such as it is, with the poet the one man who works out what may be worthy of man, be as imperishable as himself — a joy forever.

There are so many and such varied things of beauty for which special art lovers turn to Italy for the models, that the rest of us have sometimes lost sight of the universality of her successful artistic production all down the centuries, amid the almost infinite details which so many different classes of people admire intensely. We fail to see the trees because of the leaves. There is scarcely a department of art work in which Italians did not excel the world in modern history at least. What is true for art is true also for literature, though not to quite so great a degree, but what is not generally recognized is that it is true also for a great many other modes of intellectual achievement. In education, in science, in philosophy, in social work of all kinds, above all in aspirations after what is best in life, Italy has been a leader of the European nations at so many different times that the debt of civilization to her is almost beyond computation.

It is with the idea of bringing this out "now that it may be told," after the Great War is over and the nations are

INTRODUCTION

settling down after their precious self-conceit over material progress and pursuit of monetary prosperity to re-value their values of life and set up standards of national achievement that shall be really significant, that this book is published. Measured in terms of what were thought significant human values before the war Italy's career all down the centuries of modern history as a nation was a profound failure. As a matter of fact the nation represents probably better than anything else in history the success of failure. A great many of Italy's artists and poets received almost no pecuniary reward and very little material return for their great art work. Measured in terms of money their lives were failures. Some of them to whom money came generously enough, as Michelangelo or Donatello, placed it freely at the disposal of their friends, content only if they had enough to live on to enable them to go on with their work. It is not surprising then that their mother country, Italy, should have had a similar experience. What is important to realize, however, is that while going through that experience Italy accomplished so much that the world will never willingly let die and has left an imprint on modern civilization so deep that the influence of it will be felt so long at least as this stage of our culture shall endure.

It is probably not an exaggeration to say that modern civilization not only owes more to Italy than to any other nation of Europe, but owes more to her than to all the other Western nations put together. Italy for the past thousand years has been to our modern world what ancient Greece was to the old world, the mother and mistress of the arts, the fountain head of literature, the foster-mother of education, the beneficent patron of the arts and crafts, and — though this is less well recognized, the faithful nurse of the sciences. Sir Henry Maine once ventured to say that "to one small people it was given to create progress. That people was the Greek. Except the blind forces of nature nothing moves in this world which is not Greek in its origin." The expression perhaps represents the fond exaggeration of a devotee,

INTRODUCTION

but if Italy were to be associated with Greece it would come very near being literally true so far as things intellectual and artistic are concerned. It was Mr. Gladstone, I believe who once said, "whatever lives and moves in the intellectual order is Greek in origin, and whatever lives and moves in the spiritual order is Hebrew in origin," but it must not be forgotten that in modern history Italy combines these two great streams of tendency, intellectual and spiritual, and carries them on to highest expression.

Most people recognize that in the Renaissance Italy was the mistress of the world in all intellectual matters. The explanation of this in their minds would be the fact that it was to Italy that Greek ideas and ideals first came in the time of the Renaissance and that as the Italians had the first opportunity it was not surprising that they became the leaders of European civilization. It is usually presumed, however, that Italy occupied that position for only a comparatively brief period and it is even assumed that other nations have since far surpassed her. Indeed it seems to be generally felt that it was the mere accident of her geographical position closest to Greece that gave her an incidental temporary leadership at the beginning of modern history.

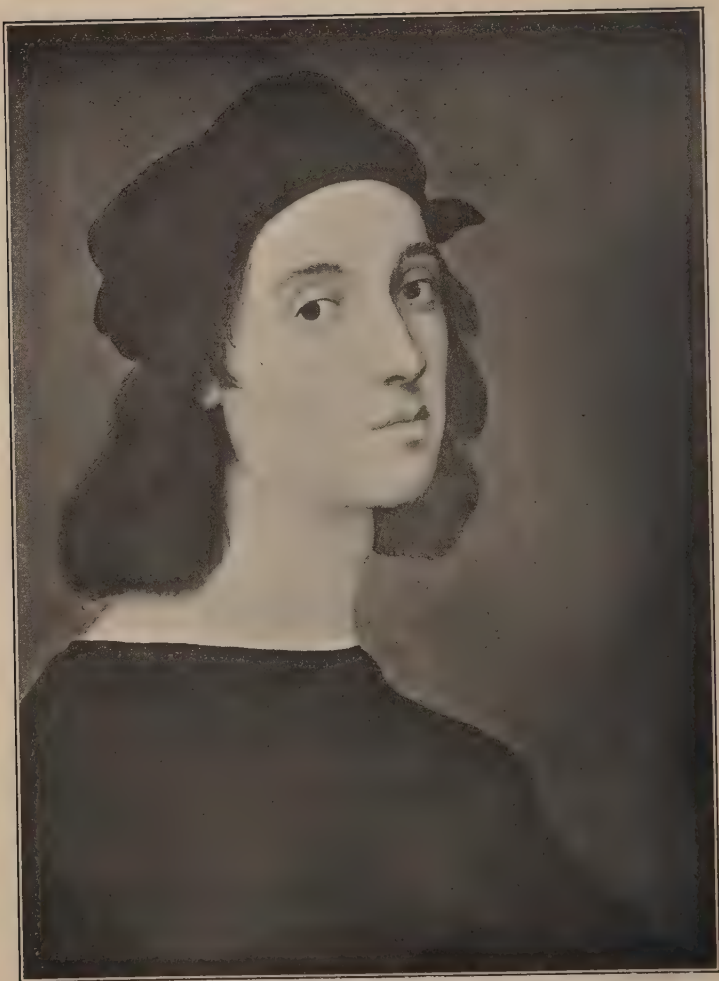
As a matter of fact, however, long before the Renaissance Italy had been the leader of European civilization in every department of intellectual effort and for long after the Renaissance she continued to hold her premiership. Indeed it is only during the past century that the world has ceased to look almost exclusively to her for incentive in practically every department of aesthetics and the graduate education of the world was in her hands for full seven centuries before the beginning of the nineteenth century. In the first half of the nineteenth century while Ampère, Cuvier, Lamarek, Laenec, Geoffroy St. Hilaire and so many others were teaching there, France became the country to which men in other countries made their way whenever they sought special educational opportunities and facilities higher than those that could be secured at home. During the second half of

INTRODUCTION

the nineteenth century when Liebig and Von Baer and Nägeli and Johann Müller's pupils, Virchow, Helmholtz, Theodor Schwann had developed into great teachers and the Higher Criticism of the Bible was attracting attention, Germany came to occupy that enviable position, but for more than seven centuries before that Italy was the home of graduate teaching.

Students went down there for art and sculpture as of course they still do, as well as for architecture and for classical scholarship, but also for mathematics, for astronomy and above all for medicine and surgery and for what we have come to call the biological sciences. Great leaders in scientific thought down to the nineteenth century were either Italians or almost without exception they had been educated there. One need only recall the names of such foreign students of Italian universities as Copernicus, Vesalius, Linaere, Harvey, Steno, not to mention many others, to have that truth vividly brought home. In art, in every century almost without exception the most distinguished names are those of Italians. When artists of other countries did great work they owed inspiration and incentive to Italy. The Byzantine art, so-called, of the earlier Middle Ages which we are coming to appreciate so much more in recent years, is in spite of its name, largely Italian in origin and accomplishment. With the foundation of modern art in the later medieval centuries, the names of Cimabue, Duccio and Giotto are on the corner stones. If anyone thinks, however, that because these are the initial names on the roll of modern artists the bearers of them represent work that is crude and unworthy of the great development that has taken place in art since, they are not familiar with the expressions of modern art critics. Duccio's painting particularly is highly praised and Giotto has been confessedly the master of painters in every generation since his time. There is probably no one who conveys better on canvas the impression of solidity than this Florentine of the thirteenth and fourteenth century.

In the fourteenth century men like Gaddi did work



RAPHAEL.

INTRODUCTION

worthy of their great masters of the thirteenth. With the fifteenth century came the revival of art induced by contact with Greek influences and the list of names of men who achieved distinction in art is so long that it would be futile to try to mention them. Even the forerunners of the period, Mantegna, Massaccio, Melozzo da Forlì, Mino da Fiesoli, Gentile da Foligno, Benozzo Gozzoli and others represent great landmarks in the history of art. They are but the prelude to a glorious list of names including Fra Angelico, Fra Bartolomeo, Perugino, Pinturricchio, Signorelli, Botticelli, Correggio, Titian, the Vivarinis, the Bellinis, Raphael, Leonardo and Michelangelo, nearly all of whom had done immortal work before the fifteenth century closed. The next century opened with many of these men still alive and ready to do their best work, but their immediate successors such men as Tintoretto and Veronese are only less great in art achievement than the giants of the Renaissance. The latter half of this century was to see decadence from this high order of accomplishment, but some of the names of those who were doing their work in what is confessedly a decadent period are greater artists than most countries can lay claim to at the climax of their art history. Among them are such men as Giulio Romano, Giorgione, Domenichino and Carlo Dolei.

There is almost no century in history in which the greatest of living painters were not Italians, though in the seventeenth century when Murillo and Velasquez were doing their great painting in Spain and Rembrandt and Rubens achieving their artistic triumphs in the Netherlands, Italy had for a brief generation or two to yield her leadership in art to them.

What is true for painting is true also for sculpture. Beginning with the great work of the Pisanis in the thirteenth century, Italy has had during every century for seven centuries very great sculptors and usually the acknowledged greatest sculptors of the world. The Pisanis were followed in the fourteenth century by Ghiberti and others only less well known and they in turn by the group of men who did

INTRODUCTION

such surpassing work in the Renaissance period, Donatello, Verrocchio, Luca della Robbia, Leonardo, Michelangelo, and John of Bologna. There is great decadence in sculpture during the period after this magnificent outburst, but undoubtedly Bernini is the greatest of sculptors in the world of his time and when the revival of good sculpture came at the end of the eighteenth and the beginning of the nineteenth centuries, Canova was a leader in thought and in execution and Thorwaldsen, the Dane, went down to Italy to find the environment most suited for the development of his artistic genius.

In architecture the world's debt to Italy is quite as great as in any of the arts. The Byzantine architecture of the Middle Ages which we have come to admire again so much in recent years and are using effectively in many modern buildings is an Italian development. The Romanesque which follows the Byzantine in the history of architecture had its origin in Rome and spread thence because bishops from the Northern countries of Europe on their visits *ad limina* to the Pope admired the beautiful Roman buildings and were stimulated to imitate them. The Gothic style is usually not thought of in connection with Italy but the first buildings in this style in Europe were probably erected in Sicily and the Normans who developed this style so magnificently obtained their original ideas for it on their incursions along the shores of the Mediterranean Sea. Renaissance architecture which is influencing all our modern buildings not only ecclesiastical, but also civic and mercantile is almost entirely of Italian adaptation from the classic and our architects are simply adopting ideas worked out by the Italian architects of the fifteenth and sixteenth centuries, only rarely turning aside to be influenced by other countries and modes of thought. The French Renaissance architecture to which many of our architects recur is very largely Italian in origin. Many of the chateaux on the Loire were designed by Italian architects.

Everyone concedes Italy's primacy in the world of art in all its forms, but a great many people seem to have the

INTRODUCTION

feeling that this was Italy's special gift and that the Italian contribution to world literature is not nearly so significant as what the Italians accomplished for the arts. Confessedly great as is the world's debt to the Italians for art what is owed for literature is but very little less. Certainly there is no modern literature that surpasses the Italian in its interest for the men of all nations. Dante gave us without any doubt the greatest of modern poems. There are some excellent literary critics of eminently judicial temper—not Italians—who think the Divine Comedy the greatest poem of all time. Dante's only rivals in primacy as a poet are Homer and Shakespeare. But so far from Dante being "a solitary phenomenon" even in his own time, in spite of Carlyle's suggestion to that effect, he was but one of many Italian writers who in the later Middle Ages did surpassingly great literary work that was destined to endure.

The Italian troubadors sang some of the most tuneful verses that the world has ever had. The author of the *Dies Irae*—we are not sure who he was but he was undoubtedly an Italian—wrote in rhymed Latin what is perhaps the sublimest poem that ever came from the hand of man. His nearest rivals are Italians. Petrarch invented the sonnet and introduced that personal note into literature which has been dominant ever since. Boccaccio re-invented the novel and with all his faults showed what a precious mode of literature the short story could be.

All this in the centuries that shared Dante's life between them. Succeeding centuries were less prolific of great work yet never barren and often Italian writers were leaders in literary thought and form. Ariosto deeply influenced the literary men of every country in Europe, Tasso made a supremely great epic poem that was widely read all over Europe for two centuries. It is below the *Divina Commedia*, but greater probably than any modern epic except possibly the work of Camoens and Milton. In dramatic literature Italy is behind Spain and England though she has made important contributions even in this mode of letters and the

Italian drama has not a few of its most precious gems concealed from ordinary view in the librettos of the operas in which Italy was so fruitful and in which poet and musician so often successfully co-operated for the production of a great work of art. Even during the nineteenth century, however, probably a larger number of books that have been read beyond the bounds of their native country have come from Italy than from any other nation, certainly than from any other in proportion to population.

One of the world novels that nearly every person of education and culture in the nineteenth century read and no student of literature would care to confess ignorance of is Manzoni's *I Promessi Sposi*. Another book that has at least that eminently desirable distinction of having been a favorite among educated people everywhere for several generations, is Silvio Pellico's "My Ten Years' Imprisonment." Alfieri's dramas probably attracted wider attention than those of any other dramatist of the early part of the nineteenth century and D'Anunzio at the end of the century has been played in every country and while we may deprecate his influence there is no doubt at all about his power of observation or his ability to express himself with a distinction of style that has seldom been reached in any other country during our period. He has been distinctly one of the few world writers of our generation.

Those who are quite sure in spite of Italian development and accomplishments in art and literature that the Italian people are after all inferior to the sterner, sturdier, northern and western peoples in practical achievement, will be very likely to think that while in what perhaps they would call the less significant expressions of human intelligence, in pure aesthetics, painting and sculpture and literature, even architecture the people of the peninsula may have been marvelously successful, they have lacked that depth of intelligence and comprehensiveness of mental grasp that would enable them to solve the great problems social, political and philosophical of the world. If there are any who think so they are indeed

sadly mistaken and their opinion is founded entirely on ignorance of what the Italians have done in these departments of world thought.

Many centuries of scholars have declared that after Aristotle, Thomas Aquinas, born at Aquino in Southern Italy was probably the greatest philosophic genius that ever lived. It used to be the fashion to make little of or at least to try to ignore Aquinas and to proclaim that only Catholic theologians and students of philosophy shackled by the Church paid any attention to him. Such talk, however, came only from men who did not know their Aquinas and who indeed perhaps found it too difficult an intellectual task to get such a thorough acquaintance with him as would enable them to appreciate him properly. His is not a philosophy with which one can scrape up a bowing acquaintance and an easy pretense of knowledge after a few hours of reading. Scholasticism is not the sort of system of thought that can be charmingly discussed and nicely disposed of between a few spoons of ice cream after a hebetudinous dinner, or between two cups of tea at an afternoon party. After seven centuries, however, it is coming back into prominence in educational circles outside of the Catholic Church. Huxley found him eminently satisfying for his logic and his power of mental penetration into the problems of life and the universe. Aquinas is but one of many deep original thinkers among the Italians and Anselm and Lanfranc and Peter Lombard, the Master of the Sentences, Bonaventure, Telesio and many others down to Rosmini have kept up the traditions of great philosophic thinking.

In political science we may differ with Macchiavelli, but no one can doubt the genius of the man or his power to set forth political problems, or even to solve them, once his peculiar notions with regard to government are accepted as justifiable. They are not and can not be justified of course, but from a certain standpoint no one has ever argued out more completely the laws underlying the success of tyranny. The curiously interesting corollary of his great work is that it also

exposes the methods of the successful tyrant for the contemplation of those who wish to neutralize such pernicious activities.

While philosophical genius can not now be denied to the Italians, but on the contrary it must be admitted that during every century since the tenth they have had men of wonderful influence, all in all, far surpassing those of any other country, the modern who misunderstands them will be almost sure to think that this is only after all speculative philosophy and that as with regard to aesthetics probably the genius of the people of the peninsula is attuned to that. In physical science, however, he would be likely to argue that they have been far behind the other nations. There are some who might add, with that interesting tendency to applied psychology now popular, that probably the genius of the Italian mind is unfavorably disposed towards the exact sciences and the practical developments of scientific principles.

Some might even add that as Italian scholars were to a great extent prominent ecclesiastics, this accounts for the Church's definite attitude of pronounced opposition to science and it is indeed rather this national trait than Christianity itself that led to Church opposition to science.

As a matter of fact Italy has contributed far more to science than any other nation and indeed has almost done more for scientific development than for any other department of the intellectual life. Our very generally accepted notions to the contrary are entirely due to the fact that we have missed many chapters in the history of science and knowing nothing about them have concluded there must be none. In every phase of science, however, the Italians have been persistently active investigators and eminently successful in their researches.

In astronomy and mathematics the Italians have been particularly fruitful. Everyone knows of the work of Galileo but he is only one of a series of men who taught in Italy and attracted students from all over Europe. It is sometimes thought by those who misunderstand the Galileo incident,

that because Galileo was persecuted by the Church every other effort in that line had been fully suppressed. As a matter of fact, however, from the days of Leonard of Pisa in the thirteenth century, those who wished to learn more about mathematics and astronomy than they could learn anywhere else in Europe had gone down to Italy. Regiomontanus, the Father of Modern Astronomy, as he has been called, studied in Italy for ten years and subsequently went back to work at the correction of the calendar there. Cardinal Nicholas of Cusa who taught the doctrine that the earth is not stationary but moves as do the other stars and is not the centre of the universe, spent much time in Italy. Copernicus to whom we owe the heliocentric theory studied with Professor Novara at Padua and spent nearly ten years of his life in Italy making his mathematical and astronomical as well as medical studies and when his great book revolutionizing modern astronomy was published he dedicated it to the Pope Paul III in recognition of all that he felt that his science owed to Italian encouragement and patronage. The Papal observatory at Rome continued to be a focus of astronomical development. In more recent times Piazzzi, the discoverer of the asteroids, Secchi who added so much to our knowledge of the sun and stars, Schiapparelli, famous as the originator of the idea of canals on Mars, Gilii, who did so much for meteorology and many other world known astronomical scientists were Italians.

In the other physical sciences the names of many of the important discoverers are as we shall see mainly Italians. Galileo's name is at least as important in physics as in astronomy and there were such distinguished compatriots as Toscanelli, Toricelli, Beccaria, Galvani, Volta, Avogadro to whom we owe the great law that bears his name in chemistry, Melloni famous for work in thermic electricity and in our time Marconi to whom the development of the wireless telegraph owes so much.

It is sometimes thought that while the physical sciences owe much to Italy the biological sciences were either neglected

INTRODUCTION

or the study of them was prevented by Church influence. Nothing could well be so false as any such impression as this. In anatomy and physiology more is owed to Italy than to all the other nations put together. They anticipated the discovery of the circulation of the blood both in the lungs and throughout the body, they made original studies in digestion and respiration, in regeneration, in embryology and in practically every other phase of related function and structure. Not only did Italians do great work in these departments, but the greatest students and discoverers in them from other nations received their instruction in Italy and were not only willing but proud to declare their obligations to their Italian teachers. Vesalius studied in Italy, as did Guy de Chauliac the great French surgeon; Steno the well known professor of anatomy at Copenhagen and Harvey whom the English so deservedly honor were both students in Italy and grateful all their lives for the opportunity thus afforded them. So was Dr. Caius who introduced dissection into England and Linaere the great Royal Physician of Henry VIII who founded the Royal College of Physicians. Many other men came home from Italy to be the centre of scientific influence in their own countries. Students went to Italy for the biological sciences literally from every country in Europe. Foreign Royal Societies and scientific bodies of all kinds honored such men as Malpighi and Beccaria and Morgagni and Spallanzani and many others by electing them as members. They realized very well however that in honoring them they were really honoring themselves.

We know now, though the knowledge has come to us only in the last twenty years, that the work of many of these distinguished discoverers and teachers in anatomy had been anticipated by the great artists of the Renaissance period. Leonardo da Vinci particularly has left us sketches of a series of dissections made by him especially valuable for the muscular bone and joint systems. At one time Leonardo proposed to write a text book on human anatomy. Had he the time to do so Vesalius' work would have been largely antici-

INTRODUCTION

pated. Nearly every important artist of the Renaissance period did dissections. We have many anatomical sketches from Raphael and Michelangelo. Leonardo and Michelangelo also made dissections of the horse in order to plan equestrian statues and for their pictures of horses in action. They had the feeling that unless one knew what was under the skin down to the very bone the painting and sculpturing of the outside of the animal would not give a proper sense of its reality, solidity and vitality.

It is rather amusing to hear it said, though that used to be a commonplace in one variety of history, that anatomy was forbidden by the Popes or at least that its development was greatly hampered by the prohibition of dissection. The human body is declared by these zealous historians to have been deemed entirely too sacred to be cut up for anatomical purposes. The great anatomists during the very time when the prohibition of anatomy is supposed to be effective were papal physicians making their researches at the Papal Medical School and dedicating their text books to the Pope. At the same time the great Renaissance artists were doing dissections very freely and evidently anyone who wanted to get the opportunity for dissection could procure material without difficulty. Nowhere else in Europe was this possible. Vesalius had to rifle the graveyards in Paris in order to obtain bones for purposes of study. When he went down into Spain later in life he found it very difficult to obtain anatomical material. In his earlier years he had to take down the corpse of a malefactor that had been hung outside the walls of Louvain and bring it in piecemeal in order to secure a complete skeleton for demonstration purposes. His great anatomical studies by dissection were made in Italy. The nearer to Rome the more the opportunities. Italy ruled by the ecclesiastics and with their universities all under Papal control practically was providing opportunities for the world.

To those who realize for the first time this prominent place of Italy in anatomy there may come the thought that the Italians mainly devoted themselves to theoretic questions

in anatomy and did not develop its practical side, that is, did not apply their discoveries to surgical procedure so as to relieve human suffering and overcome the human deformity. If there are any who still continue to harbor this dear old fashioned notion they have the greatest surprise of their lives waiting for them in the real development of Italian surgery. Pres. White suggested in his *Warfare of Theology with Science* that until the Emperor Wenceslas at the beginning of the fifteenth century by imperial decree required surgery to be held in honor once more, there was no serious development of this important department of medical practice.

It so happens that during two centuries, the thirteenth and fourteenth, immediately preceding the date of the German Emperor's decree as cited, one of the greatest developments of surgery in all history occurred. All of this magnificent development of surgery came in Italy at the hands of the Italian Surgeons. The Four Masters of Salerno, Theodoric, Ugo of Lucca, William of Salicet and Lanfranc all of them did fine original work in surgery and left us their textbooks which were printed by the Renaissance printers and have been fortunately for us republished in the last twenty years. These men did all the operations that we do at the present time. They opened the skull for tumor and for abscess, opened the thorax for pus and for fluid of other kinds, opened the abdomen for many surgical reasons but particularly for wounds of various kinds, insisted that wounds of the intestines would always prove fatal unless repaired, invented a needle holder for their proper suturing and did many different kinds of operations for the radical cure of hernia. They contrived a number of forms of apparatus for fractures, dislocations and various deformities and were particularly copious in their inventions of surgical instruments of many kinds.

While it may be thought that at least in science Italy has meant very little in what she has been able to give to civilization in recent years, any such thought is a presumption founded on ignorance of the realities of the history of science in the last century. A list of names that represent and recall

INTRODUCTION

distinct scientific achievement of the most valuable kind can be cited from Italy.

At the beginning of the nineteenth century Galvani and Volta were alive and Morgagni and Spallanzani were not long dead. At the end of the nineteenth century Golgi was doing his great work in brain anatomy and Marconi his in the application of the principles of electric radiation to wireless telegraphy. In the midst of the century there occur such men as Melloni, who did so much for thermo-electricity, Corti after whom the organ of Corti in the ear is named because of his successful researches on it. On the opening day of the nineteenth century Piazzi discovered the first of the asteroids a discovery which opened up a new phase of astronomy during the first half of the nineteenth century while in the latter half it was Schiapparelli's suggestion with regard to the lines on Mars as representing canals that attracted more popular notice, though also probably more scientific attention, than any other astronomical theory of the modern period. The contributions to the medical sciences from Italy in the past hundred years have been looked for with care by all those interested in medicine, for they have often been leaders in medical thought always doing serious work in the progressive forefront of medical advance. On nearly every important phase of modern medicine there are significant accounts of valuable research and original investigation. Italian medical journals are carefully followed by all those who are trying to keep abreast of genuine medical progress.

There are more names of Italians attached to organs and diseases of the human body than of all the other nations of Europe put together. This is not due to any vanity on the part of the Italians, but is the natural tribute of contemporaries to discoverers who had found something in the human body that had not been noted before. Not infrequently when the names of men of other nationalities are attached to structures which they first described, these men were students of the Italian schools and had actually made their discoveries down in Italy and were proud to acknowledge their obligations

INTRODUCTION

to Italian masters. Sometimes when a name of another nationality is attached to a structure by common usage it has been found that his discovery was anticipated by an Italian who had recorded the fact, but in the midst of the large amount of good work that was being done down in Italy no attention was paid to it and the foreign name slipped into a place that should have been occupied by that of an Italian. The discussion of this subject of scientific onomatology in its relation to Italians (see chapter on Biological Sciences) is one of the strong proofs of Italian priority of discovery in the biological sciences and a demonstration of the immense debt that the world of science owes to Italy.

Italy then has made a series of surpassing contributions to every department of human aesthetics, painting, sculpture, architecture, but it has also excelled in what may be called the more definitely intellectual arts, literature, education and music. In spite of a very common impression to the contrary Italy has also been the most important factor in the development of science and has usually been the leader, often the teacher, of the world and nearly always the serious rival of any other nation exhibiting successful interest in science. Besides the peninsula has given birth to men and women who from their intellectual or ethical qualities have deeply influenced the world of their time and succeeding generations for the expression of what is best in human life.

In order to show then what the debt of civilization to Italy is we shall take up in succession the arts, education, scholarship, literature, science and then the life stories of some of the men and the women who have made Italy the home of the highest culture and the active centre of some of the most significant social movements in the world's history in modern time.

PAINTING

ITALY is acknowledged by all to be the world mistress of art in modern times. The great artists of half a dozen periods in modern art have been Italians. Men of all countries with art inspirations have longed to go to Italy at nearly all times in modern history, either for the sake of personal touch with the best artists of the world who have been doing their work there; or because of the inspiration of her great collections of art which unlike those of other countries, are practically all her own. Other countries enthusiastically collect examples of Italian art, so as to make their art museums of value for their own people and foreign visitors. How immeasurably the galleries of Munich, of Dresden, of Vienna, of Petrograd, of London, even of the Louvre would lose in interest if their examples of Italian painting and sculpture as well as Italian art work of other kinds were to be removed from them. Only the galleries of the Netherlands and of Spain possess collections that have a high artistic interest of their own quite apart from their Italian paintings, though even in these it is not a little surprising to find how much attention the examples of Italian art which they exhibit, always attract.

Italy has been above all the teacher of the artists of all nations for there are not many great artists of other countries who have not been influenced deeply by Italy and Italian masters. Few great artists in their own time failed to look to Italy as the Alma Mater of their art inspiration. As time has gone on Italy instead of losing her primacy has mounted higher in art estimation and though many of her pictures have been taken from her as a result of the foreign invasions,

to which in Filicaja's poignant phrase her very wealth of beauty made her liable, she still remains a surpassing treasure house of the great world of art. This is as true in our time as in the past. At the beginning of the nineteenth century Italy was despoiled by Napoleon and ever since her precious art has been filched from her by the Napoleons of finance of all nations in the generations that followed, but still she is acknowledged the home of greatest art, the mecca for artists from all over the world.

The Italian peninsula nearly everywhere has been wonderfully fertile in art impulses, marvelously productive in art accomplishment. One little portion of Italy has been indeed so fruitful in supremely great art that it seems almost as though there must be something special in the soil of that part of the country which brings artistic talent to maturity. Within a radius of comparatively a few miles around Assisi in the wonderful "Hill Country" the original impulse of four great periods of art may be traced. The old Etruscans of the seventh and eighth centuries B. C., have left us beautiful decorations, charming and genuinely artistic jewelry, fine decorated pottery and other art objects, the remains of which though buried in the tombs for two thousand five hundred years still serve to show how high was the art inspiration and how successful the accomplishment of a people with regard to whom we know almost nothing except their arts and crafts, whose language is as yet a dead letter for us, whose history has come to us only in the caricature of it made by the Romans, but whose power of achievement in art reveals them incontestably as great leaders in the artistic history of mankind. We need no more than their art to make us appreciate their place as a wonderful people.

Some six centuries later when the Romans themselves under the influence of Greece had wakened up to culture and art expression, some of the most beautiful examples of Roman architecture were erected in this part of the country. A striking demonstration of this is to be seen in the facade of the Temple of Minerva still standing in the market place in



ENTRANCE. PALAZZO PUBBLICO, PERUGIA, ITALY

Assisi. When Goethe made the visit to Assisi about a century ago, of which he tells in his letters, he did not go, as modern pilgrims have so invariably done, in order to get more closely in touch with the scenes of the life of St. Francis of Assisi, nor to view the great art of the Franciscan Church. Indeed he tells us himself that he refused even to take the little walk that would be necessary to enable him to see the Franciscan Monastery and Church with Cimabue's and Giotto's treasures. He was in the Hill Country viewing the remains of old Roman architecture, one of the most beautiful of which is the facade of the Assisian temple of Minerva. All around the neighborhood, at Perugia, Orvieto and at many other places are almost equally beautiful remains some of them of the loveliest artistry. Charming little temples to various deities, erected under the Grecian art impulse and with a refinement and finish characteristic of the Roman period when wealth was plentiful and taste was demanding may be seen here and there through the region, for the Romans of the time were intent on making their charming Hill Country landscapes still more beautiful by the shrines they erected.

When a dozen centuries afterwards the first modern revival of art came with the earlier renaissance in the latter half of the Middle Ages Cimabue and Giotto both did some of their best work at Assisi. The beloved St. Francis in his return to utter simplicity of life lifted men out of mere worldliness and self-seeking to a rebirth of art as well as letters and as was only fair, the first great fruits of that earlier renaissance come to maturity in his country and in his honor. Two centuries later when the later renaissance, unfortunately thought by many the only one, began to manifest itself in Italy, the Hill Country became the scene for the fourth time in its history, of some of the world's greatest art. The more distinguished pupils of that distinguished master Perugino, so named after the city of Perugia, a few miles from Assisi, drew the attention of the world to this portion of Italy. Among these pupils was Raphael whose

genius was destined to illumine not only his own time, but all the after generations of the art world.

It might seem as though the suggestion that an American millionaire could not do better than bring over some of the soil of this wonderfully productive Hill Country to grow men on it, in the hope that we here in America might if possible secure some of the wonderful initiative and artistic impulse of this favored region, is not so entirely absurd as perhaps it appears at first. At least the suggestion may serve to emphasize how much the world owes to this little portion of Italy and how often it has proved a well spring of art that was never to die.

While Etruscan and Roman art belong to the Italian peninsula and the world owes a debt for them to Italians, we shall only dwell here on what is more particularly known as Italian art in our modern sense of the term. Before the beginnings of what we think of as modern art, though some of the best of it came in the later Middle Ages, in the days when what is called Byzantine art developed, there was some magnificent artistic work done in nearly every century.

While Byzantine art is usually thought of as oriental and undoubtedly there are strong oriental elements in it, it must not be forgotten that the Byzantine Empire after which it was named, was the Roman Empire transferred to Constantinople because the western barbarians had overrun Italy and made art and culture impossible. Byzantium was the older title of the Italian colony on the Bosphorus whose site was selected by the Emperor Constantine in the fourth Century for the new Capital of his Empire. Although this capital has been known as Constantinople since that time, the adjective Byzantine (probably for reasons of euphony as preferable to Constantinopolitan has been applied by moderns to the Empire whose sole capital it became and to the art and arts and crafts and architecture which developed there. The Byzantine style however, is not oriental in origin, but is a distinct evolution from the earlier classic art of the Graeco-Roman period in Italy and owes more to Italians than it does

to oriental peoples. Some of the finest examples of its art and architecture are to be found in Rome and Ravenna.

The tomb of Galla Placidia at Ravenna is a typical example in charm of decoration and beauty of eternal architecture of what was accomplished in the earlier part of the Middle Ages under the influence of what is termed Byzantine art and St. Mark's at Venice is the striking example of the same artistic influence nearly 500 years later yet before modern art, in the ordinary acceptation of the term had awakened. Surely any one who knows these two great gems of constructive art, so beautiful in their decorative appeal, will not be likely to think little of Byzantine art in general. The absolute permanence of the color of their decorations done in mosaic have preserved for the modern time all the charm of their original state and only for this it would probably be extremely difficult to persuade the world that these medieval Italians cherished, during the ages so often thought of as dark, an unfailing taste in the employment of color masses for decorative purposes.

Cimabue and Duccio, not to mention many others who did good art work were deeply influenced by the Byzantine art around them in the thirteenth century, and though long before their time it had hardened into a formalism fatal to genuine artistic expression so far as it should be a reproduction of nature, it was never without its power to accomplish good work of charming decorative effect and sometimes even haunting beauty. Indeed the modern cult of the Italian primitive painters of the thirteenth and fourteenth centuries has taken some of the master artists of our own generation back to Byzantine influence. Some of Sargent's work in the Boston Public Library, representing as it does probably the best work of this kind done in our day, remains as yet, under certain aspects, difficult of appreciation by many who come to see it. The use of raised gilt work, and even low relief to enhance pictorial effects is entirely unfamiliar to our generation. It represents, however, a return to proper appreciation of artists whose work had long been under the ban

almost of contempt because it was thought that they had found themselves compelled to violate the canons of the art of painting in order to produce their effects. This imitation of the Byzantine work is the sincerest flattery of their achievements we could have.

The beauties of Byzantine art, as applied to decoration consisted mainly of the color effects. As has come now to be well recognized the formalism of the designs assists the color effects and indeed is largely essential to them. Colors are more effective when boldly opposed and contrasted with one another and less effective when connected by shaded transitions or modified tints. Professor Goodyear in his *Roman and Medieval Art* (New York The MacMillan Company 1905) has emphasized the charm of Byzantine decoration and insists that "as far as color results are concerned, the beauty of the form is a matter of indifference. This appears in the fine color effects of many oriental designs whose forms are stiff and unnatural. It is when we study the mosaics in their architectural position and their decorative color results that the peculiar Byzantine style is seen at its best and for the given use and place it then seems absolutely perfect — from a decorative point of view." It is this that was forgotten when Byzantine art was regarded so contemptuously, but in recent years we have come to recognize and appreciate something of its true value. Francois Millet once said that the only definition of what is beautiful that satisfies the artist is that a thing shall be suited to its surroundings, — a gnarled oak tree is beautiful in its own place. The Italian decorators of the Byzantine period knew this principle very well and followed it very closely and in so doing created not only the most beautiful art of their time, but an art essentially beautiful for all time. Hence the revival of many Byzantine effects in art that have come in our generation.

What is usually thought of as Italian art came after the passing of the Byzantine and the development of the modern art ideals in the period so well called the earlier Renaissance. With that there came into existence a supremely

great art impulse in Italy the three greatest factors in which were Cimabue, Duccio and Giotto. The more carefully the works of these men have been studied the higher their reputation has become. Because of certain naïve qualities and the lack of detailed technique and finish of the modern time it used to be the custom to regard them not a little with the feeling that their art had only a comparative value. For their crude time they had accomplished very much, though of course it was thought that contemporary and even subsequent admiration for them was exaggerated by the fact that they had gone so much farther than their predecessors and were so far ahead of their own time that their work meant much for art development. Artists have always realized, however, the absolute values of their magnificent paintings and a more general appreciation of these has come in recent years. This has been brought about, not by the development of a fad or fashion, but by art education in such a way as to cultivate better taste and more genuine artistic appreciation.

When we hear of Cimabue's or shall it be called, in harmony with modern criticism, Duccio's Madonna of the Ruccellai Chapel carried enthusiastically in procession by practically the whole population of Florence, most people are inclined to think of this manifestation of devotion to art as rather a testimonial of surprise that successful painting should be accomplished at all, than as a spontaneous cordial tribute to great art. Most visitors to this shrine of primitive art are deeply disappointed in what they see and are likely to conclude that it is rather because he was a genius pioneer than with any idea of attributing surpassing ability to him as an artist that art loving generations ever since have crowded to see this picture. Anyone who reads the studied judgments of experts and the tributes of art critics will not be likely to remain in this belittling mood. The greater the expert as a rule and above all the more he has studied this particular picture the higher is sure to be his panegyric of the artist and his work.

W. J. Stillman in his articles on *Italian Artists* in *The Century* (Vol. 37 No. 10, Page 64) says of it:

“The Madonna of the Ruccellai Chapel is still one of the chief objects of pilgrimage of lovers of art who go to Italy; and it is still hanging, dingy, and veiled by the dust of centuries, in the unimposing, almost shabby, chapel of Santa Maria Novella, probably where Dante saw it, its panel scarred by nails which have been driven to put the *ex-votos* on, split its whole length by time’s seasoning, and scaled in patches, the white *fesso* ground showing through the color—so obscured by time that one hardly can see that the Madonna’s robe was the canonical blue, the sad mother’s face looking out from under the hood, and the pathetic Christ-child blessing the adoring angel at the side. Like all the work of its time, it has a pathos which neither the greater power of modern art nor the enervate elaborateness of modern purism can ever attain. Something in it, by an inexplicable magnetism, tells of the profound devotion, the unhesitating worship, of the religious painter of that day; of faith and prayer, devotion and worship, forever gone out of art.”

The very fact that the populace of Florence should have followed this picture with such devoted admiration and should have made a feast day of the bringing of it into the chapel where it was to remain, is of itself the best possible evidence of the taste in art of the Florentines of this period. In our time only the passage through our streets of some distinguished and successful competitor in athletics, above all in the prize ring, would call forth such a tribute of popular admiration. Such an event even yet sometimes disturbs business in a whole quarter of the city showing that there are still deep popular interests, but they are very different from those which the people of the early thirteenth century had in a commercial city like Florence.

It is easy to think of these primitive painters as after all representing only beginnings in art. Their interest for the moderns is often supposed to be due rather to the fact that they were beginners, greatly venturing in the attempt

to express their vision, rather than artists who accomplished much. The primitives lack the nice technique, the finish, the smoothness so facile of accomplishment for even the art student of the modern time, and they make mistakes in the application of first principles of painting, that even the apt student of a few months training in the modern time would think it a disgrace to make. Only artists can judge, however, of the place of an artist and almost needless to say the unanimity of praise on the part of artists for these primitives is most striking. Nor is their praise in a low key, nor expressed apologetically because of the place of these artists in the history of art at its beginning. Few men in the modern time have ever studied more carefully the painting of these primitives than Timothy Cole when he was engaged in reproducing some of them in the famous series of woodcuts for the Century Magazine. His opinion then both because of his opportunities and his own distinction as an artist as well as his demonstrated power of expression must be considered of great value. Twenty five years ago he wrote in enthusiastic admiration for instance of Duccio whose name, so much less known than that of Cimabue, deserves to be familiar to art lovers:

“I should like to write particularly of the artist Duccio, or rather of his work, which has really fascinated me and held me in thraldom for the past few months. His marvelous subtilities are now discoverable, since he has emerged from his long obscurity in the *Duomo* to the excellent light of the *Opera del Duomo*. When away from Duccio I have sometimes wondered whether the high qualities that I was attributing to him were not a little of my own making, and this thought added gusto to my next visit. But I am convinced now that he can not be praised too highly, and in fact each time that I come away from him it is with a sublimer idea of the man. He is strength and ineffable tenderness artlessly combined, but he must be seen and studied to be believed in.”

There is often an impression that color is a comparatively modern invention or at least that the artists' power over it

did not develop much until the Renaissance time with the coming of the Venetians. Probably nothing could be more erroneous than this for though color owed much to the Venetians and above all they made it possible by their achievements in the development of color technique for every artist to use it easily and perfectly if he desired, the genius artists of the earlier time in Italy solved the problem of its employment and succeeded marvelously in using it effectively. Timothy Cole for instance says of Duccio, speaking of his famous entombment of the Virgin to be seen in the Duomo of Siena:

“In some instances his coloring is Titianesque — warm, lustrous, and deep. The garment of the Virgin in the entombment is a deep blue, of a most charming hue. That of the apostle next to Peter and immediately above the head of the Virgin is also a blue, but of different, warmer, and softer tone, so that here, for instance, is a relief of color very subtle and harmonious. That of the apostle John, who holds the palm branch, is a rose pink in the high lights, shading to a deeper red. The contrast this makes with the lovely blues is the most pleasing thing imaginable to look upon. Now the garments of the apostle whose head comes just above the stars of the palm-branch are also red, similar in tone to the deep shading in John’s garment; but there is a softness in tone about it that gives just the proper relief to the latter. Then the palm branch of which the stars are gold, is a delicious soft, tender green, shading gently deeper to one side, and this again is properly relieved against the deeper green of the garment of the apostle the top of whose head comes just behind three of the stars. This apostle, from the type of his face and his long hair, is evidently James, the ‘brother’ of our Lord. The garment of the one next to him, whose hand comes in proximity with those of the Virgin, is a charming mixture of warm purple and greenish-blue tints. That of the one next to him is of a warm brown, well relieved against the brownish shadows of the rock behind. So on throughout — always a pleasing variety and subtle relief of color. The marble tomb is of a reddish warm tone, roughly



DANCE OF THE AZULES (GIOTTO)

hewn, as I have engraved it. The trees, carefully worked up in detail, are of various shades of lustrous green, and the sky and glories around the heads are gold. The flesh tints are warm brownish yellow, while the flesh of the Virgin is relieved from that of the others being deader in tone. The whole is a most harmonious combination of color—a true symphony in color.”

The third of these great beginners in modern painting, Giotto, is undoubtedly one of the greatest painters of all time and his work has never lost its significance for mankind. In recent years there has been a revival of interest in him and a growing admiration for him which shows how enduring are the artistic monuments that he created. Berenson has not hesitated to say that few artists have ever been able to express so thoroughly the sense of solidity of objects on flat canvas as Giotto and that he may still be and indeed often is yet studied with great advantage by artists for this reason. With a wonderful power of composition, the visualization of genius, a power of expression unrivalled and a fertility that has never been surpassed even by the greatest painters of the later Renaissance, Giotto is one of human nature's proudest boasts, one of the supreme artists of the world's history. Like Dante whenever he has been most admired and his influence has been the deepest the taste of the time has been best and its accomplishment most enduring. Whenever Italy has failed to appreciate Dante and Giotto her own literature and art has been at their lowest ebb and taste in art and letters has been unfortunately decadent. Giotto besides being a great painter was a great architect and his beautiful tower is still one of the wonders of the world of artist history. Many an idea is borrowed from it even in the most recent time. *The New York Times'* building in many ways a replica is sometimes declared the handsomest skyscraper in New York.

For those who feel themselves inexpert in art and hesitant as to the opinion they should hold with regard to Giotto, Timothy Cole's expression when he found himself in the

Arena at Padua may well serve as a helpful guide. This modern American with critical appreciation thoroughly developed by the close study of the great art of all periods, found himself supremely impressed by the artist who six hundred years before our time had done his painting in the chapel that had been constructed out of some of the materials and in connection with the remains of the old Roman arena at Padua. When all the marvel of Giotto's work here had come home to him Cole wrote:

"I am here in the Arena Chapel, and am at last confronted by Giotto. How brilliant, light and rich the coloring is! It quite fulfills all that I had read or thought of Giotto. I am conveniently located and the light is good, but it is hard to keep at work with so many fine things above one's head. I can scarcely escape the feeling that the heavens are open above me, and yet I must keep my head bent downward to the earth. Surely no one ever had a more inspiring workshop."

These are the painters of the Thirteenth Century. Every century of history since has had its greatest art in Italy. For a short time in the seventeenth century Italy was eclipsed by Spain and the Netherlands in painting. In the later nineteenth century she yielded the palm to France. At no other time has there been any serious rivalry of her artistic supremacy for some seven centuries. Even after the glorious outburst of the Thirteenth Century when decadence from so high a level of art might have seemed almost inevitable the very next century gave birth to a number of painters in Italy whose works we admire ever more and more as we know more of them and whose paintings have increased greatly in value in recent years. A group of artists at Siena created a school of painting parallel to that of Cimabue and Giotto at Florence and only less great than that climax of art expression. The best known of these are Simone di Martino, Lippo Memmi and greater than any of them perhaps Ambrogio Lorenzetti. Orcagna at Florence in the fourteenth century did some wonderful work that has come into its own, a very high meed of admiration, in recent years, though at all times

he was looked upon as a great artist. The tall and lithe and willowy forms of his ladies in the *Paradise of the Santa Maria Novella*, Florence, were an anticipation of many ideas that were taken up by modern painters. Taddeo Gaddi whose work was mainly done about this same time is another of these wonderful Florentine painters whom modern artists have gone back to appreciate more and more. The only way to attain any adequate appreciation of such great artists is to have seen their works after a due training in artistic ideals or to accept the criticisms of those whose taste can be relied on. The more that is known of these painters in our time the more highly they are rated.

Each of the cities of Italy was the home of a great art movement and the birthplace of a group of artists who would do credit to a nation rather than to a comparatively small town. It is scarcely necessary to say that probably none of these Italian cities had much more than 100,000 people at any time until the last century and that those above the 100,000 mark in population at any time were very few. Undoubtedly some of the smaller cities that we know of as having had schools of artists that have become famous in history, had less than 25,000 and some of them as for instance Perugia and Ferrara probably much less than this. If anything serves to show that it is not numbers but the genius of a people that counts this surely is a demonstration of it.

Florence was the greatest of these Italian cities and perhaps also the largest. The number of great names that it supplies to the history of art of men whose works will never be forgotten, and which change hands now if at all only at prices that are forbidding to any but the very rich or national museums, is so large that to do them anything like adequate justice would require a volume and indeed many volumes have been written about them. On the other hand they are so well known that we scarcely need do more than mention their names in order to have them produce all the weight of evidence for the art genius of their native country.

Some of those already mentioned, Cimabue, Giotto, Taddeo Gaddi, Orcagna were Florentines and worthily laid the foundation of the great art reputation of their native city in modern times.

With the coming of the Renaissance, however, the list of great Florentines destined to immortality for painting swells to a host. This includes such men as Fra Angelico, Benozzo Gozzoli, Masaccio, Fra Filippo Lippi and then the great trio, Raphael, Leonardo da Vinci and Michelangelo. Verrocchio must also be counted as a painter though so much better known as a sculptor and if we were to stop there our list would lack such great names as Botticelli, Fra Bartolommeo, Signorelli, Ghirlandajo, Lorenzo di Credi, Andrea del Sarto. Even after mentioning all these, doubtless there are many ardent students of Florentine art who would find sad gaps in such a brief summary of the names of men who accomplished great things for art in Florence.

The difficulty of writing about Italian painting becomes mainly a matter of not trying to mention all the names of artists whose works are still very much admired for their marvelous vision of the poetic and the real and their power of expressing what they saw with the eyes of the mind and the body. We can only pick out a few of the greatest in each century so as to give a good idea of what was accomplished. In the second half of the fourteenth century Spinello Aretino the pupil of Taddeo Gaddi who had himself been a pupil of Giotto did some charmingly beautiful work. The best examples of it are to be seen in the Campo Santo at Pisa. His famous Battle of St. Ephesius with the Pagans of Sardinia shows that the artists of this time did not hesitate to attempt the most difficult problems of human and equestrian action on canvass and solved them with marvelous success. There are few more spirited encounters ever painted than this and perhaps none that are more dramatically expressive. About this same time but living over into the beginning of the fifteenth century was Gentile da Fabriano who died about 1427. According to Vasari, Michelangelo once said of him

referring to his name Gentile which means delicate, graceful, "his touch is like his name." Van der Weyden the great Flemish artist declared that Gentile was the greatest man in Italy. He was called from Orvieto to Rome to decorate the newly restored Church of St. John Lateran, but the frescos all have unfortunately perished though some of them were to be seen in Michelangelo's time. His Adoration of The Kings in the Academy of the Fine Arts at Florence is extremely beautiful. He exhibits in his work according to W. J. Stillman "the love of lustre and the jewel like quality of the Flemish brothers Hubert and Jan Van Eyck and his pictures seem a prophecy of those of Albert Dürer, but in the essentials of the art spirit of the great Italian schools — the matter of looking at nature and the subjective way of the treating of details — Gentile remains true to his immediate ancestry."

Then in the first half of the fifteenth century came another of the very great artists of all time Fra Angelico. His work is now so well known that surely little need be said to show how much the world owes to Italy for this great man. The great monastery of San Marco at Florence is indeed a museum of Fra Angelico's work as every one of the cells contain one of his frescos. Timothy Cole who studied them so carefully in his preparation for reproducing many of them in woodcuts declared:

"The delicate freshness and coolness of the tints blend softly and harmoniously together — simple, pure, colors, laid in sometimes with fine pencilings. In the 'Crucifixion' in the cloister the shaven face of Saint Dominic at the foot of the cross is treated so finely and delicately that the attempt is made to show each separate shaven hair by minutely fine dots. In this fresco is displayed all this painter's knowledge of the technic of his art. The wings of his angels are enlivened with tints of green, yellow, violet, etc. contrasted harmoniously."

Some of Angelico's paintings as for instance the Angels of the Resurrection or the Annunciation are among the most

frequently reproduced paintings in the world. His marvelous charm of expression in his celestial subjects, his wonderful coloration which has not faded in all these years, and the beautiful decorative effects of his paintings show what an artistic genius he was. He was beloved by his contemporaries, he has been praised by all the great artists, he deeply influenced his own time and the immediately succeeding period in art and some of his disciples are among the greatest of painters.

Almost contemporary with Fra Angelico, but unfortunately dying before he was thirty was Masaccio whose wonderful dramatic power deeply affected the art of his time and who must be looked upon as the first of the painters who showed a distinct recognition of the every day world as a mine of art. His famous fresco of "The Tribute Money" is well known. The Christ of the picture has been a favorite study for artists since. The attitude of Christ is magnificent.

"The eye falls naturally upon Him at once, taking in the broad play of light from the outstretched arm, while the air of commanding dignity, and the beauty of the neck, barer than those of the others, aid in distinguishing Him. But one needs to mount a step-ladder and get nearer to the picture to appreciate at their full value the moral strength and manly beauty of Christ's countenance, his nobility and strong personality, and the subtlety of the expression of authority in His face. The other heads, too are admirable, and grouped finely together, in graceful and easy composition." (Timothy Cele.) In the chapter on Italian Scholarship will be found Leonardo da Vinci's tribute to his "perfect works" and their lesson of fidelity to nature for artists for all time.

Among the other men at this time who are famous and whose work will never fail to be the subject of admiration are Fra Filippo Lippi and Benozzo Gozzoli. "Filippo was the first to substitute for the ideal in art the personal and there is for the first time in the progress of Christian art a distinct and systematic employment of the individual and the personal in the representation of sacred personages

especially of the Madonna, an employment which later becomes the rule." His escapades as an escaped friar, the story of which we owe to Vasari, have now all been denied and Cavalcaselle has completely wiped out the aspersions on his good name. In the Uffizzi at Florence his famous Madonna adoring the child Jesus has been the subject of almost endless admiration and is very frequently reproduced in our time. The adoring angels in the picture are remarkable for their sweetness and marvelous innocence. The group is gracefully and naturally disposed, forms a charming composition against the quiet background which is also full of interest. In the Duomo at Prato a short distance from Florence are found his most important works which are among the greatest creations of the art of the fifteenth century. No man with the character the gossip loving Vasari gave him could ever have painted these profoundly religious paintings.

Later in many respects even than Fra Lippo Lippi and well worthy of his great master Fra Angelico, is Benozzo Gozzoli. His best known work is at the Campo Santo at Pisa. He introduced many portraits into its frescos including his own and as a consequence we have some very interesting memorials of himself and his contemporaries. W. J. Stillman says of him:—

"In all we have of Benozzo's work there is a cheerful sense of the influence of nature, and a love of children and animals such as we have not before him; and in this painting of children he seems especially happy. In his Campo Santo series he introduces them on every convenient occasion. The individuality of his heads and even the character of his figures, have that air of unmistakable likeness which belongs to earnest portraiture, and to a degree not indicated in any previous Italian work or in any contemporary prior to Giovanni Bellini, who was eight years the junior of Benozzo."

Then come the men of the glorious second half of the fifteenth century in Italy whose work is so well known that it is scarcely more than necessary to mention their names in order to bring out how much the world owes to Italy for them.

Some of them are not as well known as they should be except by painters, but all of them represent great landmarks in the history of art. There is Andrea Mantegna, the first painter to come under the influence of the Italian Renaissance, that is of the new ideas and ideals that had arisen in Italy as a consequence of the study of the Latin and Greek classics and the remains of classical art and antiquities generally. It is hard for anyone but a painter apparently to understand the marvelous influence Mantegna had. He represented in himself the two great streams of tendency the Gothic art that had come down from Duccio and Giotto with the spirit of antiquity transforming it into something closer to human nature than the wonderful visions of the old religious painters had been. The well known Mantegna triptych in the Uffizzi Gallery at Florence composed of the Adoration of the Magi, the Circumcision and the Ascension is one of the foundation stones of modern art.

At the end of the fifteenth century came the period that has been called the Later Renaissance and it brought a wonderful outburst of artistic genius above all in Italy. Each of the cities of the Peninsula during this Renaissance period supplied as many painters as would ordinarily prove quite sufficient for a nation's fame. Their names and achievements are so well known that scarcely more than a mention of their names is needed. Florence was the great leader and Fra Angelico and Benozzo Gozzoli were only a prelude to Botticelli, Filippino Lippi, Rosselli and Ghirlandaio who with so many others took up the light of art and carried it on. Then there was Verocchio better known as a sculptor and yet doing some great work as a painter and above all influencing deeply three such great pupils as Lorenzo di Credi, Leonardo da Vinci and Signorelli, himself a great painter who deeply influenced Michelangelo. Finally, for there must be an end to the list there was Andrea del Sarto one of the last of the artists in the Golden Age of painting in the city by the Arno.

In the meantime Venice had made some remarkable contributions to painting, particularly in all that concerns

color. Venetian experience in glass making at Murano had prepared the artists of the city for the use of pigments of all kinds and above all such as were likely to be permanent. The Vivarini family began the great work that was to make the Venetian School of Painting the colorists of the world. Crivelli was one of the greatest of the early artists and then came the Bellinis and especially John Bellini and his pupil Vittore Carpaccio who did modern painting at its best. At the beginning of the sixteenth century Venice possessed a school of artists which for glory of color and technical power has never been rivalled. The names of the great artists of that school are the familiar possession of all the educated people of the world. Their pictures are one of the most precious heritages of the race. They have deeply influenced all painting ever since and they will doubtless continue to do so until this stage of our civilization has passed completely. There is no need more than to mention their names for everyone to know how much we are indebted to Italy for them. Palma Vecchio, Giorgione, Titian, Lorenzo Lotto the great portrait painter and then Tintoretto and Paolo Veronese.

Many volumes have been written about these artists and still men go back to them for their wonderful power of visualization and their almost more wonderful ability to reproduce their vision in glorious color. They lived in the supreme sunlight of Venice and their colors have as a rule something of the limpidity of light and the glorious effulgence of the spectrum. While famous for color they are almost more deservedly famous because of their composition, their marvellous recognition of the limitations and yet the capacity of paint and canvass to express phases of human life.

A city like Ferrara usually not thought of as a great art centre yet gave the world such fine painters in the fifteenth century as Francia and Lorenzo Costa and has among its painters such well known names as Ercole Grandi, Dosso Dossi, Cosimotura and Garofalo. Ferrara was intimately connected with Bologna, some of these men working there; but Bologna

is almost better known for the three Carracci, Guido Reni, Domenichino, and Guercino. When one enters the Vatican Gallery and sees Guercino's picture of the Incredulity of St. Thomas, or recalls how often Guido's *Ecce Homo* has been copied, one realizes how much these men have influenced the world not only of art but of thought and that they are not mere names known to a few favored art amateurs or painters interested in the history of their profession but great human factors for culture and art development. Even a little town like Parma gave to the world Correggio and his pupil Parmigiano. Some of Correggio's pictures, though this wonderful young man like Raphael died before he was forty, are now looked upon as among the greatest pictures ever painted. Grimm in his *Life of Michelangelo* has said that this young Parmese though untravelled, combines some of the best qualities of the work of Raphael and Leonardo and Michelangelo. No one has more deeply influenced young artists than Correggio and few artists are better known through the many copies made of him. But far from being merely an artists' artist Correggio is one of the most popular of Italian painters.

In the centuries since the Renaissance, Italy has at various periods yielded the primacy in painting to other countries for a time as for instance to the Spanish school in the first half of the seventeenth century, to the Netherlands in the second half of the seventeenth century, to France in the later half of the nineteenth century, but the peninsula has practically never since the end of the Renaissance been without some distinguished painters. In the latter half of the sixteenth century there were the Carracci, Palma Giovane, Pietro da Cortona, Caravaggio with Sassoferato and Salvator Rosa making their early achievements. In the first half of the seventeenth century some of these men reached their maturity and Carlo Maratta, Guido Reni, Sebastiano Ricci, Carlo Dolci, Domenichino, Guercino, Paolo Pannini and Luca Giordano were doing their work, most of them carrying it on until near the end of that century. In the eighteenth century

came Tiepolo, Canaletto, Zuccherelli and others. Even when there has come a distinct descent in artistic taste as for instance when Guido Reni and Carlo Dolce were more popular than the great Renaissance artists and when their cloying sweetness seemed the highest attainment of painting, Italy's influence was deeply felt and it was in reaction against this that the realistic Dutch painters secured their finest success. As it is the names of such men as Guercino and Domenichino in this group which represents Italian decadence show how high the preceding period of great art had climbed.

The name of Italy has become almost synonymous with painting at its best. This was above all Italy's gift to the world. In recent centuries Italy's painters have shared the decadence of painting generally, but they have continued to be looked upon as great teachers of art, and painters from all over the world have gone down into Italy to study and those most interested in art in various countries have felt that they could do nothing better for the progress of art in their own countries than to establish scholarships which would include a year of study in Italy, for an Italian visit does more to stimulate artistic impulse than almost anything else that can happen to a young artist. Even Francois Millet, the most original of modern painters, declared that he owed nothing to modern French art and that above all the art teachers of Paris had not helped him, though a visit to Italy and the study particularly of the Italian primitives had proved of great inspiration to him. But then why argue as to Italy's supreme place in painting as well as of art work of every other kind since all the world admits it?

SCULPTURE

IN SCULPTURE Italy bears away the palm from all other nations. Not only has she done more of great work in sculpture than all the other nations put together, but it might well be said perhaps without exaggeration that what has been accomplished outside of Italy is of little significance compared to the wealth of Italian work. It might even be added with the accord of most artists, that the sculpture of other nations in modern times has practically always been executed — with such notable exceptions almost alone as the Gothic sculpture of North France in the thirteenth and fourteenth centuries — under Italian influence.

The Romans are usually not thought of as having contributed significantly to world sculpture. In this department of aesthetics as indeed it must be confessed in every other, they were so overshadowed by the Greeks that there is almost inevitably a reactionary tendency set up in the modern mind to depreciate or minimize their work when the enforced comparison with the surpassing excellence of Greek art suggests itself. It must not be forgotten, however, that while the Romans were confessed copyists of the Greeks, some of the copies made by them show not only a marvelous spirit of appreciative art judgment and artistic skill, but a perfection that represents the highest talent, if it does not reach up close to genius. While Virgil and Horace are copyists they have made magnificent contributions to world literature and scarcely less can be said of the Roman sculptors in their department. For a time many of the statues dug up at Rome were attributed to the great Grecian sculptors of the highest period of classic art, though most of them have since

come to be referred to Roman sculptors of the early Christian centuries. Not a few of these sculptures came to have magnificent influence in the Renaissance period over the nascent plastic art of modern times and even as late as the end of the eighteenth century Winckelmann's book on the Laocoon was a bugle call of awakening not only for the modern German artistic spirit, but aroused most of the rest of Europe. Many a sculpture group or portrait statue that used to be extolled to the skies as an example of the highest Greek art has fallen in estimation since the demonstration by archaeologists that it was of Roman origin, but the force of the implied compliment to the Romans in the meantime must not be forgotten. The group of portrait busts of the emperors and of distinguished men and women of Rome have probably never been excelled in portrait sculpture. They have been the favorite study of artists at all times of genuine appreciation for art, while at the same time they have been constantly recurred to by historical writers who realized their value as extremely significant human documents. In minor sculpture, in architectural ornament, in vases, in urns and great basins, indeed in all the decoration of their baths the Romans reached a height of sculptural effect almost unexcelled.

Of sculpture in the earlier Middle Ages there was comparatively little, but so scant has been the information about what there actually was and its extent has been so imperfectly realized that the presumption has lain very near in many minds that there was practically none. Byzantine sculptors however not only deserve mention but they should have as significant a place in the history of art as have the Byzantine painters and decorators. As was the case with their colleagues in painting and decoration, the Byzantine plastic artists were mainly Italians by birth and training and the new form of decorative sculpture developed at Ravenna. The sculptors did not devote themselves to regular subjects, but "marble screens, altars, pulpits and the like were ornamented in a very skilful and original way with low reliefs of graceful vine plants,

with peacocks and other birds drinking out of chalices, all treated in a very able and highly decorative manner." (Encyclopedia Britannica.) Byzantine art is decorative in purpose in every form and our appreciation of it has grown just in proportion as our sense of genuine decorative beauty has developed in the modern time. While the word Byzantine very naturally tempts us to think of all this decoration as Eastern in origin, the work is purely Italian in initiative, conception and execution.

That the Italians of the Middle Ages even before the time of the earlier Renaissance could do good plastic work the bronze statue of St. Peter in the great Church of St. Peter's at Rome, the toe of which has been kissed smooth by visitors, gives excellent evidence. This is an early work with a simple dignity and vigor of treatment which shows a great artist at work. It is sometimes said, even in guide books supposed to be reliable, that this is an antique statue of Jupiter transformed into that of St. Peter by the addition of the keys, but the report is untrue and it only affords additional evidence of the feeling of profound admiration for the work that it should thus be attributed to the times of classical sculpture.

Unfortunately for any history of monumental plastic art at this time it became the custom for sculptors to devote themselves to work in the precious metals. Small statues and sculptured decorations of various kinds were made in gold and silver, but they proved too tempting for human cupidity and necessity to be enduring. They were often very beautiful, as some few striking remains attest. For example at Friuli there are some charming statues bearing crowns and jewels. But it is easy to understand that when wars and political disturbances came the material of which these works of art were composed was as a rule entirely too valuable as mere bullion for them to be allowed to continue in existence as works of art and accordingly they were either stolen or removed by the authorities or by revolutionists, melted down and used for the financing of all sorts of projects. We know

the numbers of them there were from tradition and the few that remain attest their fine artistic qualities.

With the beginning of the earlier Renaissance in the thirteenth century beautiful sculpture was executed by many in Italy. The work of the Pisani presents some of the best sculpture ever accomplished. Niccolo the first who was called Pisano, born at the beginning of the thirteenth century, is the greatest of these. His beautiful relief of the Deposition from the Cross in the Tympanum of the side door of the Church of San Martino at Lucca is remarkable for its artistic composition, the gracefulness of its execution and its delicate finish. The wonder of its beauty grows when one learns that the sculptor was probably not thirty years of age when it was done. When he was about fifty he did the celebrated marble pulpit for the Baptistry at Pisa, copies of which in the full size of the original are now to be seen in so many of our most important museums everywhere in the world. His great pulpit at Siena, a copy of which sometimes replaces it in collections of replicas, is on a grander scale but in the judgment of critics is probably not so beautiful. The dignified simplicity of the earlier pulpit shows what fine austere artistic taste Niccolo had when working only to suit his own ideas, but apparently the desire of the Siennese to have in their pulpit a show piece grander than their Pisan neighbors, tempted him to somewhat overload its successor with decoration.

Giovanni Pisano the son of Niccolo is usually considered to be little if any inferior to his father either as sculptor or architect. To him we owe the Campo Santo at Pisa and the masterpieces of sculpture over the main door and inside the cloister. The most magnificent of his works is the marble high altar adorned with almost countless figures and reliefs in the Cathedral of Arezzo. His beautiful tomb of Pope Benedict XI with a sleeping figure of the Pope guarded by angels who draw aside the curtain (fig. Encyclopedia Britannica) is one of his most charming works and a marvelous triumph of plastic achievement. A work by Giovanni Pisano that is very well known and has always attracted attention

is the beautiful little chapel of Santa Maria della Spina, that is of St. Mary of The Thorn on the banks of the Arno in Pisa. The special treasure of this little chapel is a thorn said to be from the crown of thorns of the Savior and this gem-like chapel is a worthy reliquary even for so precious a relic.

Alongside of Giovanni Pisano worked Arnolfo del Cambio also a pupil of Niccolo Pisano whose best known work is perhaps the Tomb of Cardinal De Braye at Orvieto. Just at the beginning of the fourteenth century a pupil of Giovanni Pisano who became known for that reason as Andrea Pisano did the first of the three world famed bronze doors of the Baptistery at Florence, that on the South side. He had been a goldsmith as were many other of the celebrated sculptors and artists of Italy and he worked for many years at this marvelous piece of bronze work which has been declared by critics as perhaps the finest the world has ever seen. "It has all the breadth of a sculptor modeling with the finish of a piece of gold jewellery," (*Encyclopedia Britannica*.) He was largely influenced it is said in this work by Giotto. To him is also attributed the execution of the double band of beautiful panel reliefs on Giotto's Campanile the subjects of which are the Four Great Prophets, the Seven Virtues, the Seven Sacraments, the Seven Works of Mercy and the Seven Planets, the designs of which are said to have been suggested if not actually made by Giotto.

Andrea Pisano had two sons Nino and Tomasso the former of whom executed a number of statues of the Madonna and the Child which are full of human feeling and sympathy and gentle loveliness. They have been declared "a perfect embodiment of the Catholic idea of the Divine Mother." Some of Andrea's pupils however, far out-distanced his sons in sculpture. The most famous of them is Andrea De Cione who is better known under the name of Orcagna. Orcagna's father was a goldsmith and he too had had the training of the shop. He is almost as famous a painter as he is a sculptor, but like so many of these men of the Italian Renaissance he exhausted the whole round of achievements,

has done some magnificent work in mosaic, was a splendid architect and a poet of much more than ordinary ability. He had a large number of pupils and deeply influenced the succeeding generation. The great marble tabernacle in the chapel of Or San Michele in Florence is wholly from his hand. This in its "combined splendor of architectural design, sculptured reliefs and statuettes and mosaic richness, is one of the most important and beautiful works of art which even rich Italy possesses." The design for the Loggia Dei Lanzi in the Piazza della Signoria in Florence is attributed to him though it was not actually begun till after his death. Probably no work of sculpture anywhere in the world is more magnificent than the wonderful tabernacle by him which we have already mentioned. It has been the favorite study of artists, sculptors, decorators, architects ever since and it has deeply influenced many generations. It never tempted to exact imitation because it seemed almost beyond the powers of anyone after him, but suggestions from it are to be found in many parts of the world.

Another one of the famous pupils of Andrea Pisano is Balduccio de Pisa to whom we owe the wonderful shrine in the church of San Eustorgio at Milan only less famous and less admired than that of Orcagna at Or San Michele. There is another magnificent shrine of St. Augustine in the Cathedral of Pavia which shows how many great sculptors were at work at this time. Ghiberti who did the third pair of the famous bronze doors of the Baptistry of Florence has usually been looked upon as one of the great masters of sculpture of all time. These doors used to be thought of greater significance as a work of plastic art than the critics admit now, because it is usually said that Ghiberti went beyond the limits that can properly be assigned to plastic art. So great a critic as Michelangelo however, is said to have declared that these doors were worthy to be the gates of Paradise. They certainly constitute a marvelously beautiful and an almost endlessly attractive work of art. Some of Ghiberti's statues in the Church of Or San Michele and especially those of St.

John the Baptist and St. Stephen show how well he could execute pure statuary work of the highest excellence. His bronze doors have deeply influenced not only the sculpture, but also the art of Italy and they have served to stimulate every visitor of artistic genius who has come to see the wonders of Florence.

But this is only a beginning of the story of sculpture in Italy. Notwithstanding the magnificent accomplishment of the earlier Renaissance Italy's supreme achievement in sculpture was to come in what is usually known as the later or true Renaissance. The group of names in connection with that movement is the best known in the history of sculpture. It begins with Donatello and includes Leopardi, Verrocchio, Leonardo Da Vinci, the Della Robbias, Benvenuto Cellini, Michelangelo, and John of Bologna. There must also be mentioned the men who decorated the Certosa of Pavia of whose names we are not sure and a host of sculptors of minor distinction many of whom however, would have been looked up to as possessed of surpassing artistic powers in any other time or country. Men of such distinction for instance as Mino da Fiesole, the two Rossellinis, Benedetto da Maiano in Florence alone and the rivals and imitators of Michelangelo Baccio Bandinelli, Giacomo della Porta, Montelupo, Amanati, and Vincenzo di Rossi are among those that deserve mention.

One need only give the names of the masterpieces of the greatest sculptors for all to recognize what supreme works of art they executed. Donatello's Gattamelata at Padua is one of the greatest of the equestrian statues of the world. He seems to have been the first in modern times to have conceived the idea of making an equestrian statue and this was the result. The actual casting seems to have been done by Leopardi but all the arrangements had been made for it by Donatello. Ordinarily it would be assumed that the first work in a mode of this kind would be crude and that succeeding artists would gradually improve in technique and execution until a really great work of art was achieved.

SCULPTURE

Whenever a genius sets himself to the accomplishment of a great purpose he does it as well at any time in the world's history as at any other and he usually owes very little to his predecessors. Nowhere is this better illustrated than in the case of Donatello's equestrian statue. Some of his other works as for instance his statue of St. George outside the Church of Or San Michele at Florence must be considered as surpassed only by some of Michelangelo's work and that of the Greeks.

The next great equestrian statue came from Verrocchio. It is the masterpiece, the Colleoni at Venice. Verrocchio was the master of Leonardo Da Vinci as a young man and a still greater equestrian statue than that of his master is said to have been made by Leonardo. This was the famous figure of the Duke of Milan on horseback. Unfortunately having been set up in plaster for criticism it was shot to pieces by the French soldiers who had captured Milan and taken the Duke prisoner. Anyone who doubts the tradition of its greatness must recall the fact that this generation which declared it the greatest of equestrian statues had before it Donatello's Gattamelata as well as Verrocchio's Colleoni and therefore was in a position to judge.

As the culmination of this group of Renaissance sculptors came Michelangelo. He has done greater work in sculpture than any other except the Greeks and his sculpture is surpassed if indeed surpassed at all by but very few of the masterpieces of Greek sculpture. His David on the hill at Florence in bronze or the original in marble is a very triumph of the plastic expression of youth. His Moses made for the tomb of Pope Julius II and now rendering the Church of St. Peter in Vincoli a pilgrimage place for all who are interested in art is among the unrivalled sculptures of the world. The statues for the tomb of the Medici at Florence, his galley slaves which constitute the prize pieces of several museums and his Pieta have perhaps never been equalled in their artistic qualities. Michelangelo has influenced the world of art probably more than any other man that ever lived. He saw

in large figures, and leaves always the impression of not having been quite able to execute his vision, yet his accomplishment is greater than his works. It is no wonder then that he so deeply influenced not only his own generation but many succeeding generations.

A series of most beautiful contributions to plastic art were made by the della Robbias and especially by Luca della Robbia. He had already demonstrated the possession of the powers of a very great sculptor, as his choir in the Duomo at Florence clearly shows, when he became interested in terra cotta work and produced the wonderful examples of groups and figures in colored terra cotta that have been the admiration of the world ever since. There are several Annunciations, a Visitation, and then the wonderful *bambinos* on the Hospital of the Innocents at Florence which all the world knows very well and which are frequently copied. A number of members of the family including at least one young woman took part in the making of works similar to these and while none of them had anything like the genius of Luca all of them did charming artistic work. Very few of the important museums in the world now are without models made in imitation of the della Robbia terra cottas and now that terra cotta is properly taking its place once more as a medium for external decoration the reputation of the della Robbias and the admiration for them is constantly on the increase. A little while after them Begarelli of Modena made a number of very clever statues and groups in terra cotta which were enthusiastically admired by Michelangelo.

One of the great sculptors of this time who deserves to be mentioned particularly for his name is well known all over the world is Benvenuto Cellini. His famous bronze group of Perseus holding the head of Medusa to which the Florentines have deservedly given a place of honor in the Loggia dei Lanzi in front of the old ducal Palace is one of the great masterpieces of modern sculpture. W. M. Rossetti spoke of it as "a work full of the fires of genius and the grandeur of a terrible beauty; one of the most typical and unforgettable

monuments of the Italian Renaissance." While so great a sculptor in monumental work, Cellini never thought art objects of small size beneath the finest artistic attention and with a true Renaissance spirit he modeled beautifully any and every form of work in metals. Flacons, bells, and even rings and jewels were executed for wealthy customers who appreciated art and coins and medals were designed for the Papal mint and for the Medici at Florence. The smaller pieces from his hands have been accepted by modern sculptors and devotees of the minor arts and crafts as veritable models of artistic excellence for all time.

Another of the great Italian sculptors is John of Bologna who though born at Douay in France is quite properly known as Giovanni da Bologna, because he was educated in Italy and lived and worked almost entirely there. His bronze statue of the Flying Mercury is one of the favorite popular pieces of which copies are to be seen everywhere. It is full of life and movement and is indeed a triumph of liveliest action in plastic work yet quite within the limitations that may be set to this form of art. Working about the same time as Giovanni in Italy were Girolamo Lombardo and his sons who made the magnificent bronze gates of the Holy House at Loretto and the sculpture on the Western Facade of the church at the same place. It is one of the delights of the pilgrim to Loretto to find how charmingly the little old house, which according to tradition was the home of Emmanuel on earth, is here enshrined. To see how lovingly it has been cared for is of itself almost testimony enough of its miraculous translation, and no more suitable place for its settling down could have been chosen than its homely surroundings amid a pious, simple, art loving people.

At the end of the sixteenth century signs of decadence in sculpture are already beginning to be noticed though they are more noticeable in other countries than in Italy. Michelangelo is alive until 1564, and at work until the very end and John of Bologna is doing his work when already the signs of decadence are notable in Germain Pilon and even in Jean

Goujon in France. With the beginning of the seventeenth century decadence is marked everywhere however, and Bernini came to rule the world of sculpture. At the beginning of his career some of his work is of wonderful technical skill and delicate high finish combined with soft beauty and grace though too pictorial in style. The attempt to imitate or rival painting became the predominant trait of his work. With the aid of a large school of assistants he produced an immense number of works of sculpture. They are progressively more unsculpturesque. In spite of this he was probably the most admired artist of his time, and one of the most regarded by his contemporaries of any time. He had undoubtedly great talent and his magnificent colonnade before St. Peter's shows how much of real genius the man possessed, which doubtless would have developed very finely had he lived in a better period. As it was he absolutely dominated the sculpture of the world and with Italy willing to praise what was in bad taste decadence was to be noted everywhere. And yet let us confess that it is after all a very wonderful decadence.

It was not until the end of the eighteenth and the beginning of the nineteenth century that a sculptor worthy of the name was born and he was Canova, the Venetian who did so much to bring back the true classic spirit into this form of art. When he did classic subjects as for instance the colossal marble group of Theseus and the Centaur at Vienna, his work is excellent and has much that is reminiscent of the best classic art. His influence did more than that of any other to bring about a reformation in plastic art. Fortunately Thorwaldsen, the Iclander, settled in Rome in 1797 when Canova's fame was at its highest. Under the fostering influence of this master and the precious spirit of great classic and Italian art all around him Thorwaldsen produced an immense quantity of sculpture of very high order and in taste closely attuned to that of the best antique art. He even excelled his master Canova in such subjects as *The Three Graces*. When Italy herself does not produce, her influence is deeply felt. Most of the sculptors who in more recent

SCULPTURE

years have attracted attention have worked in Italy and been influenced by their teachers and the great works around them in that favored country. Italy is and has always been the home of great sculpture, the Mecca for all those who are interested in this form of art.

ARCHITECTURE

THOUGH the fact is but rarely appreciated and as a rule only by those who have made special studies in the subject, the world owes quite as much to Italy in architecture as in painting or in sculpture. We have touched the classic period but passingly in every mode of human expression in this estimation of the world's debt to Italy, but it must be recalled that the Romans, taking Greek models, achieved a series of the most beautiful architectural monuments. At the beginning of the chapter on painting, I mentioned the charming structures which still remain in the Hill Country at Assisi, Perugia, Orvieto and other places as enduring evidence of Roman taste and accomplishment in architecture. Rome itself has a remarkable group of these surpassing monuments. Pompey's Theatre, the Pantheon, the Colosseum, the Theatre of Marcellus, the arches of Titus and Constantine, the Castle St. Angelo are examples that everyone will recall. How enduringly the Romans built these handsome public buildings will be best appreciated from the fact that after all the vicissitudes of time and the longest and most disturbed political history of any city in the world, notwithstanding fire and flood and even earthquake and wars and sieges and the incursions of barbarians and the even more damaging incursions of barbarous Romans who doubtless thought of themselves as representing progress beyond their old time ancestors, but used the materials torn from the wondrous monument of the past for their own passing structures, enough of these monuments still remain to bear witness to the power of construction and the fine taste of their builders.

Just as soon as Christianity was accorded the freedom

to live in the open and make public demonstration of its worship a new epoch of constructive genius opened up and architecture began to develop very beautifully. The remains of Constantine's Basilica are the best evidence of this. A wonderful evolution of ecclesiastical architecture was accomplished in a comparatively short time. There are in Rome and Ravenna a series of churches which demonstrate beyond all doubt the genius of the people of the peninsula at this time in architecture. Only a little study of the details of the construction of San Lorenzo at Rome, planned and executed in the sixth century will enable the student to realize at once how well the people of this time had solved the problem of making a beautifully impressive Basilica "house of the King" for the dwelling place of Emmanuel and for the worship of the Most High. Quite contrary to the ordinarily accepted impression this instead of being unique is but one of a number of impressive buildings that have come down to us from this time. The Church of San Appolinare in Nuovo of Ravenna, built also in the sixth century, or of San Apollinare in Classe, or San Vitale, also in Ravenna, illustrate the gradual development of this style in beauty and charm. The tomb of Galla Placidia, another of the famous structures of old Ravenna, shows how these Italians of the earlier Middle Ages, when ordinarily men's minds are presumed to be rather hide bound in their tendency to imitate rather than to originate, could adapt the ideas of the larger structures so as to enhance the beauty of even a comparatively small building. Anyone who has visited the tomb of Pasteur the great modern French scientist which is situated beneath the main entrance of the Pasteur Institute in Paris and learns that it is built in imitation of Galla Placidia's tomb, may perhaps be surprised that a modern French architect should have gone back so much more than a thousand years to a structure of the early Middle Ages for the model of a monument to a modern man of science, but no one will be disappointed in the beauty of the design that he adopted and every visitor is sure to

come away with the feeling that the architect displayed excellent judgment in his choice as a prototype.

The Byzantine style of architecture of which these are the earliest extant examples continued to develop beautifully in Constantinople, or as it was then called, Byzantium, and the mode culminated in that very beautiful structure Santa Sophia which dates from about the middle of the sixth century. Ordinarily because of its location in Constantinople and the fact that its architect was said to have been a Greek from Tralles, it is presumed that Santa Sophia is oriental in origin, but it must not be forgotten that influences from the Italian peninsula were at this time dominant in Constantinople and that it was under these that the architectural development of the Capital of the Empire came about. It was the building genius of the Italians and not at all that of the Gothic rulers of the time that proceeded to make Constantinople worthy to be the seat of empire. Santa Sophia is, after all, one of the supremely great world structures, mentioned in the same breath with Karnac in Egypt and St. Peter's in Rome as marking an epoch in human history.

The pervasiveness of Italian influence must be recognized in this just as in many of the later periods of great architectural development. As we shall see when the Romanesque followed the Byzantine, Italy's architectural genius was felt all over the western world. During the Renaissance period her influence was felt even farther afield from Spain to India. Mr. Brander Matthews reviewing E. V. Lucas' Book of Travels, reminded his readers that the Taj Mahal of India and the Alhambra of Spain are contemporaries in construction and that Italian workers in marble and in mosaic labored upon both of these supreme achievements of architecture. His authority for the declaration was Sir Martin Conway the well known English traveler and art student whose reliability on a subject of this kind can be readily appreciated. The Taj is usually thought of as being much older than the Renaissance time, but as Mr. Lucas says: "In India one falls naturally into the way of thinking of

ARCHITECTURE

everything that is not of our own time as being of immense age, if not pre-historic, but it is really much nearer to us, long past dating Giotto's tower and even following St. Peter's at Rome."

The Byzantine style of architecture of which the churches and chapel of Ravenna and Santa Sophia and other structures in Constantinople are the outstanding examples developed in many parts of medieval Italy and culminated in the great Church of St. Mark, at Venice. This basilica came into its present form toward the end of the eleventh century. Few buildings are more impressive not only because of antiquity but because of the charm of line and form and decoration. It was not begun until the tenth century and as Goodyear in his *Roman and Medieval Art* remarks much of its construction and adornment was accomplished in the period which we usually designate as Romanesque, that is the period after 1000 A. D., when the Byzantine is usually said to have given way to the next mode of architecture. Any such arbitrary and absolute distinction of architectural periods in history applies however, only to Western Europe. Byzantine art and architecture long outlived this date in its own home. Venice was so closely connected with the Byzantine Empire and with its capital city Constantinople, that it is not surprising that St. Mark's should present the best surviving picture in the world of an old Byzantine church. The style can well afford to be judged entirely by this. An architectural movement that culminates by giving rise to such a wondrously interesting building as Venice's charming cathedral represents a supreme expression of human intelligence and taste in art and of man's power over building materials. After all these centuries it is still a favorite place of pilgrimage for those who are interested in beautiful things for their own sake and above all for those who are interested in the story of human development. But to think for a moment that what attracts so many visitors is a dead influence in human life in our time would be an egregious blunder for many

of the art impulses in the old St. Mark's are waking up in modern life with genuine vigor and fine force.

The Romanesque architecture which follows the Byzantine in the history of human architectural development has, as its name indicates, its origin in Rome itself, though as a curious result of its development some of the most beautiful examples of the style are to be studied in the distant Northern countries Germany and England. The word Romanesque does not, as some people seem to think, refer to a degraded Roman style of architecture, good enough as it were for a more or less uncultured medieval people, though it may be quite unsuitable for a cultured epoch, but, as students of architecture now all recognize it, is the technical term for a really marvelous development of beautifully impressive architecture. The term Romanesque connotes the two particular traits of Roman architecture which began to be re-employed after the year 1000 A. D., the pier and the vaulting arch. These came into vogue to replace the timber roofs with columns supporting the arches of the nave which had been so generously employed before. How much this style of architecture came to mean not only for Italy but the whole of Europe of the time will perhaps be best appreciated from the fact that three of the most interesting cathedrals in Germany, those of Mainz, Aix and Speyer are in this style. That Romanesque was no mere passing fad of a few generations but an enduring contribution to world architecture, is made very clear from the added fact that two of the most ambitious ecclesiastical structures that we have planned and built on this continent in our generation, charmingly appropriate they are too, Holy Trinity Church in Boston and the Cathedral of St. John the Divine in New York are designed in this style.

As a matter of fact this style of architecture led to the creation of some of the features now most familiar in church construction. It was in the Romanesque cathedrals that the transept was introduced and a cross form given to the church. The choirs were considerably enlarged, developing the apse

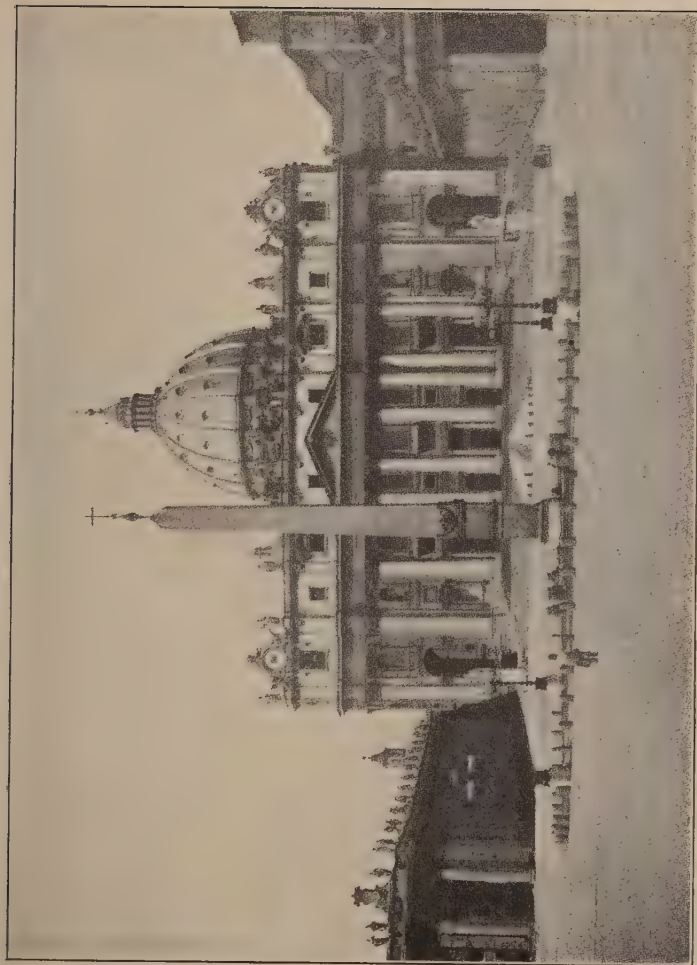
of the basilica. This new style while a direct evolution from the earlier basilicas enabled the architects and builders to give increased grandeur, size and effectiveness to the church and at the same time made for a more permanent construction. The round arch was employed and the exterior walls were massive. These instead of detracting from the beauty of the structure as a whole, were taken advantage of by the architects and artists of the time to illustrate the value for artistic effect of large surfaces of masonry.

Above all painters found splendid opportunities for the decoration of wall space and ceiling and made these Romanesque churches veritable temples of art. In the modern time we house our pictures in museums to which but a small portion of the population of our cities come and but seldom. Great art in Italy in the service of the Church was very frequently under the eyes of literally all the people for everyone was bound by Church law to go to church about 100 times a year. The result was a popular education in artistic taste such as has seldom been rivalled and only surpassed, if even there, at Athens in the palmy days of the Periclean age. The Italian painters became the beloved of their people, holding the position in popular affection only accorded to those who excel in competitive athletics or some national sport or perhaps prize fighting in the modern time.

After the Romanesque came the Gothic architecture which derived its name from the fact that it was mainly developed by the Germanic peoples, whom the generations of the Renaissance in their detestation and contempt for all that was medieval and non-classic, spoke of as Goths. While this would seem surely to indicate that the Gothic style of architecture was invented originally by the Teutonic or at least Frankish peoples, there seems no doubt now that the first European examples of it were seen in Sicily and that its characteristic feature the pointed arch, was if not actually invented by the Italians at least first employed by them in such a way as to indicate clearly how available it was for construction on a large scale. Italy's own Gothic cathedrals bear no comparison with those of the Northern countries in

magnificence for reasons that can be easily understood, for at the height of the Gothic movement, Italy harassed by wars and incessant political disturbance was not in the position to erect such great cathedrals. In spite of all this, however, such examples of Gothic as are to be found in Italy are well worthy of this great style. The Church of the Minerva at Rome, so called because built over the foundations of a temple of Minerva, is a striking example of pure simple Gothic. The cathedral at Milan is in its wealth of detail one of the most beautiful buildings in the world. It makes it very clear that even in this form of architecture so much more suitable to the darker Northern countries, which absolutely required the greater amount of light afforded by the large windows, Italy could have rivalled if she so desired and the opportunity been afforded her, the younger nations to whom the new style gave such a magnificent stimulus in constructive work.

With the coming of the Renaissance Italy's greatest architectural period develops. In every form, in ecclesiastical structures, in municipal buildings, in hospital construction, in private and public palaces there are still extant many exquisite examples of Italian taste and artistic capacity which demonstrate beyond peradventure Italian ability to employ building materials with charm and fine utilitarian purpose to carry off every point and combine the useful with the beautiful. They present monuments of impressive constructions which have never been equalled at least in modern times, for their thorough adaptation to their uses and their surroundings. The full story of Italian Renaissance architecture would be entirely too long to tell in any detail here and it will be enough to remind the reader that practically all our modern serious building that is not frankly under Gothic influence is Renaissance in model and owes more to Italy than to any other country. Such beautiful buildings as the great Church of Santa Croce, or the Cathedral at Pisa, such palaces as the Pitti or the Uffizzi at Florence, such marvels of construction as St. Peter's at Rome, in which Michelangelo put the Pantheon on top of the Colosseum, mak-



ST. PETER'S ROME.

ing it as it were a double wonder of the world, are the examples that naturally suggest themselves to anyone who thinks of the triumphs of Italian Renaissance architecture.

There are however, literally hundreds of buildings completed in the fifteenth and sixteenth centuries in Italy that are so finely planned and finished that they have been the subject of profound study by architects at all times in the world's history since, whenever men have been seriously interested in building beautifully. Rome has a number of palaces, some of them designed by Michelangelo and by his contemporaries that are used as illustrations in nearly every important text book of architecture. Venice, whose wealth and touch with the Orient and a great spirit of sublime art in painting combined to encourage high impulse in architecture, possesses in her Renaissance structures literally some of the most beautiful buildings in the world. When Ruskin wanted to teach his countrymen of the last generation something about the meaning of architecture, he called and with good reason, his series of lectures which expanded into three volumes, *Stones of Venice*. Probably no better title nor more inspiring subject could have been chosen. Comparatively unknown and quite unimportant towns of Italy however such as Vicenza where Palladio did so much of his work, possess architectural monuments which furnished suggestions for many a building of the modern time and are the fruitful subject of study on the part of the architects of every country at the present time.

Modern appreciation for Palladio's work may well be judged from what Goethe who admired him very much said of him. The great German poet had paid a visit to Vicenza, where so many of Palladio's masterpieces are to be seen and he was so delighted with them that he proclaimed in his enthusiasm: "When we stand face to face with these buildings then we first realize their great excellence, their bulk and massiveness fill the eye, while the lovely harmony of their proportions admirable in the advance and retreat of perspective brings peace to the spirit." Later he added:

“One ought to spend whole years in the contemplation of such work.”

The modern buildings of which we are most proud, the beautiful Library of St. Genevieve of Paris, and our imitation of it in the Boston Public Library, our own magnificent Public Library in New York, the Royal Exchange in England (London) the Pennsylvania Station, indeed almost any modern ambitious building shows signs of the influence of the architecture of the Italian Renaissance. After the sixteenth century there was a decadence in taste. Somehow such a degeneration seems inevitable in the course of human affairs. Men reach a climax in the expression of beauty by the use of simple, direct means, then their successors striving to equal them and yet to do something different in order not to seem to be merely imitators, and fondly hoping really to surpass them, add decoration so as to secure effectiveness. Before long the decoration occupies so much attention that the beauty of the lines of the structure itself is lost. Italy however, even in the midst of the decadence of the seventeenth and eighteenth centuries produced some beautiful structures and at least was leading the world as in preceding times. Architects went to her for ideas and her influence meant most. Always Italy has been the leader in architectural movements and the source of the ideas used in other countries and only in the last generation or so have the other nations after borrowing her constructive models equalled or perhaps at times surpassed her in architectural achievement. There are many authorities in architecture who would deny that Italy had ever been surpassed.

The theatre represents a mode of construction in which the moderns have had to think more for themselves than in other building. Churches are built with the ideas of older architecture necessarily in mind and nearly always under the direct influence of the buildings of preceding generations as models. The same thing is almost inevitably true of municipal and educational structures of various kinds. University buildings are more or less prone to be modeled on previous

achievements in this same line. Theatres however are built for a definite use and with limitations of space and cost as well as of arrangement for hearing purposes that requires the modern architect to study out at least the internal problems of construction for himself, though he may still build the exterior with classical or Renaissance ideas in mind. In theatrical architecture Italy has led the way quite as much as in every other phase of architecture. During the Renaissance period Palladio built a theatre at Venice and Serlio another at Vicenza with Vitruvius and the classical rules for theatrical building in mind. Palladio also erected the Teatro Olimpico at Vicenza which still stands as a monument of classical taste the oldest permanent theatre in Europe. These Italian theatres well known to the schools have been the models that many an architect had in mind when he did not actually copy them in planning a great theater.

The form of the classical theatre thus developed by the Renaissance Italian architects was not suited however for modern audiences and above all was quite unsuited to the demand of the present time to be able to hear the modulations of the human voice and as far as possible see the expressions of the countenance. In the modern modifications of the theatre necessitated by these restrictions the Italians have priority. In Venice as Ferguson in his *History of Modern Architecture* tells us, a theatre was erected in 1639 with two tiers of boxes arranged circularly round a pit sloping backward as at present. This constituted essentially the invention of the present form of theatre. In 1675 Fontana first introduced the horseshoe in a theatre called the Tordinoni which he erected in Rome. Fontana's invention may have been said to have completed the modern theatre in all its definite parts. In the preceding century Baldassare Peruzzi first made use of painted movable scenes. They were invented in 1508 for a piece called La Calandra which was played before Pope Leo X. The further development of this invention in Italy led to the construction of a recessed stage with a frame like that of a picture and these additions completed the modern

theatre and its stage as we know them, every important feature of it being part of the world's debt to Italy.

In the eighteenth century the need of having large auditoriums for opera which had grown popular, led to the construction of some magnificent buildings. As opera was most cultivated in Italy the great operatic theatres were naturally built there. Many of them compared in size with the medieval cathedral and the Italian architects rose to the occasion thus afforded them by creating magnificent structures which have influenced all future theatre building. The first of these great constructions was the San Carlo Theatre at Naples which within and without is a fine architectural achievement. There are six tiers of boxes and the theatre is capable of seating comfortably large numbers of people who could see and hear well and at the same time when so desirous be on exhibition themselves to their heart's content. This has come to be a very definite desideration in the modern opera house at least. The architect of La Scala at Milan, Piermarina, with the design of the previous theatre at Milan, the largest in Europe in its time, erected in the time of Barbieri, but destroyed by fire in 1776, and the San Carlo at Naples which had been built in 1737 also in mind, erected what Ferguson declares to be the best lyric theatre in existence. Very little has been done of any originality in theatrical architecture since then.

With the revival of architecture in modern times Italy as might be expected, was a leader in the movement and in spite of the fact that her people do not command the wealth of other countries her municipal buildings and other public constructions have been the models for the world of our time. Some of the Italian buildings of the past half century like the great Passage of Victor Emmanuel at Naples or the corresponding structure at Milan, the theatres and municipal architecture generally, have been the subject of serious study on the part of the architects of the world. Italy has not degenerated into a follower of others' ideas but has used the

ARCHITECTURE

models furnished by her own countrymen to good purpose for the constructions needed for modern use.

Modern architecture is practically entirely founded on Italian Renaissance architecture. It is true that occasionally buildings have been built with the idea that they are purely classical but very seldom does it prove that they have not been influenced by Italian ideas. The architects of the Italian Renaissance thought that they were using classical ideas almost exclusively, but being men of artistic genius they adopted and adapted classical structural work to their purposes. Modern architects have seen their buildings, studied their writings and plans and have been more or less necessarily affected by them. French Renaissance architecture particularly as illustrated by the French chateaux owes its inspiration to Italian sources and indeed not a few of the best known of the chateaux were built by Italian architects. Fra Giocondo among others directed the building of some of them as well as one of the bridges that crosses the Seine. Spanish Renaissance work owed not a little of its influence to the visits of Spaniards to Italy and their coming in contact with Italian Renaissance work. English architects confess their obligations to Italy, and our own Spanish-American architecture, the nearest approach to an original idea in architecture that has developed in America is deeply indebted to Italian Renaissance suggestions.

The world's debt to Italy in architecture may be said then, without exaggeration to be almost incalculable. Every mode and style of architecture that we know owes its origin and is indebted more to Italians than to any other nation for its development. Indeed it may be said without exaggeration that of most of the serious architectural ideas now in vogue in a world more interested in building than ever before, Italy is the actual or nursing mother. To remove her contributions to architecture from the treasure house of humanity would leave us poor indeed in all that makes for beauty in construction.

MUSIC

THE world owes so much to Italy in the arts generally, but especially in those which have afforded the most pleasure to man by the creation of things of beauty that are joys forever that the debt of gratitude for it all has, as so often happens, become a little onerous perhaps and some at least are likely, as a consequence, to grudge albeit unconsciously to themselves that meed of recognition for Italian achievements in other departments of aesthetics which is so amply deserved. This is particularly prone to be true more perhaps with regard to music than other things, especially as in recent years the Italians have lost some of their prestige in music. The world's debt to Italy for music must, however, be confessed to be scarcely, if at all less than that for the arts of painting, sculpture and architecture as well as the decorative arts and the arts and crafts. If Italy's contribution to music were obliterated we would be deprived of so much of what is greatest in music that there would be a sad lacuna in the opportunity afforded mankind for the enjoyment of what for many is the most charming development of human artistry and for all a surpassing motive of joy and happiness.*

Italy's great contributions to the musical heritage of the race began very early in the history of music and for many

* The candid recognition by the world that Italy has been the teacher of music to humanity is to be found in the employment of Italian terms as the common musical language of the world. Not only are words oratorio, opera, libretto and other general designations adopted from the Italian, but practically also all of the musical terms are of Italian origin. They represent that much Italian that nearly everybody knows and they have frequently come to be used in metaphorical senses so that in a way they are now parts of a universal language. *De capo*, *allegro*, *adagio*, *largo*, *soprano*, *contralto*, *basso*, *crescendo*, *diminuendo*, *andante*, *finale*, *forte*, *fortissimo*, *piano*, *pianissimo*, *staccato*, *con brio*, *marcato* and many others might be mentioned. Their universal employment is the unmistakable tribute to Italy's place in music.

centuries the Italians were alone in musical achievement that has lived to influence subsequent generations. Later, as in painting, the Netherlands took up the strain with some products of magnificent development of original musical genius when Ockenheim and Josquin of Hainault, in the latter half of the fifteenth century, did their work, and when Arcadelt and Claude Goudimel went to Rome to teach their art. England had enjoyed a distinct period of evolution in music just before the Netherlands, but as with regard to painting in oil and printing, Italy took what Western Teutonic talent had originated and lifted it up to heights of artistic excellence that gave it ever so much more significance for humanity than it possessed in the hands of its inventors. While the inventive genius of Italy is, as we shall see in the course of this book, supremely admirable in every line of endeavor, the ability of Italians to recognize and to develop the inventions of others, especially in what concerns the things of the mind and in lines of artistic taste and aesthetic accomplishment is scarcely less to be admired. When their application of these foreign inventions is not mere imitation but represents genuinely true evolution as it nearly always proves to be in the hands and mind of the Italians, it demonstrates the possession of a faculty of critical appreciation which is inferior in value only to that of original invention.

According to tradition the original musical modes of the Christian Church came to us from St. Ambrose. This tradition has been seriously doubted in recent years, but there is no doubt that sometime between the fourth and seventh centuries a series of great new developments in music took place in connection with the Christian ceremonial. The already notable Catholicity or universality of the Church, her gathering of many peoples of many kinds into her fold and especially the Oriental influences at work in her members, bore fruit in the music adopted for the ceremonial. The most noted example of this was the establishment of antiphonal singing at Milan by St. Ambrose, Bishop of that city, toward the end of the fourth century. We have

contemporary evidence for it from St. Augustine in his Confessions. After this a musical system called the Ambrosian sprang up. The four authentic scales, the basis of the medieval system, have been attributed to St. Ambrose, but like many of the hymns which are also attributed to him, most of these were probably rather the development during succeeding centuries of the needs of the ceremonial and were due to many hands and minds. Antiphonal psalmody, after the model of that in Milan was introduced into Rome by Pope Celestine about the end of the first quarter of the fifth century. The first singing schools were founded and the development of the musical liturgy went on apace until St. Gregory's time.

As with regard to St. Ambrose there is also a doubt as to whether St. Gregory really invented or arranged out of preceding elements the Gregorian music or Plain Chant which goes under his name. There has even been some question whether one of the subsequent Gregorys, Pope Gregory II or even Pope Gregory III should not be considered to have had more to do with this musical development than the great saintly Pontiff who sent St. Augustine to England, to whom it is usually attributed. One thing is sure that the liturgy as it exists to-day was essentially completed not long after the year 600 and during the next two centuries a series of magnificent developments of the music associated with this followed each other. A little later in the course of this development hymns were written and the great Latin hymns with their sublimely beautiful and unrivalled wedding of sense and sound came into use. Nothing shows better how thoroughly developed among these medieval inhabitants of the Italian peninsula was the faculty of critical appreciation in both literature and music, than the selections made for church services both as regards the plain chant and the hymns for use on special occasions. It is easy to understand that many thousands of variations of musical settings were composed, as it is also easy to realize that many thousands of hymns must have been written. Of the hymns, those chosen

as the sequences are *Stabat Mater*, *Dies Irae*, *Veni Sancte Spiritus*, *Lauda Sion Salvatorem* and *Victima Paschale*. No greater hymns, indeed probably no greater poetry, has ever been written. The plain chant which came into vogue at this same time, achieved triumphs of musical composition not unworthy of these great hymns. As Mr. Rockstro says in his article on Plain Chant in Grove's Dictionary of Music, probably no greater or more beautiful expression of grief in single notes in succession has ever been written than the chant used by the Church in the services of *Tenebrae*, for Holy Week; no more joyous succession of single notes has ever been arranged than that of the chant for the *Exultet* on Holy Saturday.

Great as had been Italy's contribution to music in this early period and form this was only the beginning of her musical legacy to humanity, for the succeeding periods were to prove even more fruitful. In the first century of the second Christian millennium Guy of Arezzo, or Guido Aretino, or Fra Guittone, as he is variously called, reformed musical notation. He had been teaching music among the Benedictines at the monastery of Pomposa in the Duchy of Ferrara. A number of inventions and discoveries of music have been attributed to him that evidently are not his, for some of them existed before and some of them came in only after his time. There seems no doubt, however, that Guido invented the principle on which the construction of the staff is based and the F and C clefs. He probably did not invent the complete four line staff itself. On the other hand, solmisation, that is, the process of using certain syllables to name or represent the tones of the scale is almost surely his invention. He also invented the hexachord and probably introduced the use of the syllables, ut, re, mi, fa, sol, la, from the initial syllables of the lines of a hymn to St. John beginning "Ut queant laxis" to designate the tones of each of the hexacords then recognized. Guido is also said to have called the seven notes of the musical scale after the first seven letters of the Alphabet down to G, whence the name Gamma taken from the last of the series, came to be applied to the whole scale as gamut, the

syllable *ut* at the end perhaps being added because of the use of "*ut*" for the first note in the named notes which has since been changed to "*do*."

After the rise of plain chant the next great development of music culminating in counterpoint and polyphony came in England and the Netherlands just before and during the Renaissance. These musical modes reached their supreme expression, however, in the hands of Italian musicians and all the succeeding evolution of music for centuries is Italian. The greatest of the Italian musicians is Palestrina, who did for music in the second half of the sixteenth century what his great Italian compatriots of the preceding generation during the Renaissance, Raphael, Leonardo da Vinci and Michelangelo, Botticelli, Titian, Corregio, and so many others did for painting and sculpture. In what he tried to accomplish no one has ever excelled him and he has come to be looked upon as one of the greatest musicians of all time. Not only did he achieve great results but his work has the widest influence through the channels of the Church and he aroused ecclesiastics all over the world to interest in worthy religious music.

Palestrina's career illustrates the gift of generous critical appreciation on the part of those without selfish interest in the individual, so often exemplified in the life stories of Italy's great men and the consequent opportunities to rise from the lowest to the highest classes which this has afforded with the precious resultant chance, so often noted in the history of the peninsula, to secure expression for talents which might otherwise have been buried. He was only a peasant farmer's son hawking vegetables on the streets of Rome when the beauty of his voice attracted the attention of the Choirmaster of St. John Lateran. He proved to have musical talent as well as a voice, so he was given a careful musical training, and became a great teacher and composer of music, creating the wonderful works which have ever since been the subject of so much admiration. Church music is entirely Italian in origin and the genius which has enabled the Italians to take

MUSIC

an eminently sensuous art and fit it to the usage of the Church for devotional purposes without distraction, is of itself a noteworthy triumph. They did it also for painting, architecture, and sculpture, showing their power of adaptation. Beauty, Francois Millet said, is suitability to environment. None have realized this better nor applied the principle more effectively in all the arts than the Italians.

While Palestrina was doing his work in Rome there came into existence in that city the first manifestations of a great new movement in music. St. Philip Neri had gathered round him in his oratorio or private chapel in Rome a number of the young men of the city in order to occupy them with useful and beautiful thoughts and afford them intellectual entertainments of various kinds so that the devil might not find work for idle hands. He was anticipating many social movements of a similar nature in modern times, but with a depth of religious feeling and a saintly winningness all his own, and he realized the place that music would surely have in such a scheme. Accordingly religious scenes and stories were set to music in various ways and above all the story of Christ's life and the prefigurements of it in the Old Testament were made a basis to illustrate in musical dramatic elements for him by the brothers Animuccia. This was the beginning of that great musical mode that we have come to know as oratorio. It did not reach the fulness of perfection until the beginning of the seventeenth century when the dramatic elements were fully adopted and adapted to it. The invention was, however, a great one in itself and almost greater because it opened the way and clearly indicated the path for the use of music in connection with dramatics generally and even that co-ordination of music and dramatics in which the drama is subordinate and which we know as opera.

Twice in the history of drama dramatic literature has come into existence anew out of developments of religious ceremonies. The hymns to the gods and the ceremonies in honor of Bacchus gradually developed into Bacchic song and then tragedy in old Greece; very similarly during the Middle

Ages the mystery and morality plays, themselves developments of Church ceremonial, were the first stage in the evolution of modern drama. Opera developed out of oratorio and oratorio itself was an evolution of the application of music to certain portions of Church ceremonial and the symbolic interpretation of mysteries connected with it. The early history of opera as that of oratorio is entirely Italian. There are a series of names which practically every music lover knows, beginning with Claudio Monteverde whose *Arianna* and *Orfeo* produced in 1607 at the Court of the Duke of Mantua established the new *genre* permanently in musical history. Recitative music had been applied before this to an entire play in *Dafne* composed by Peri and Caccini in 1597. The text or as we would say the *libretto* was by Rinuccini and three years later *Euridice* by the same poet was set to music by the same composers. They did not realize that they were creating a new form of art, and did not dream of the subsequent career of opera, but they sowed the seeds of a great musical development.

Claudio Monteverde probably was not at all conscious of the fact that he was working in and actually creating a new musical form, but had the thought come to him, far from deterring him it would rather have stimulated his best efforts, for he is one of the boldest innovators, in the sense that is to say of original inventors, that we know in all the annals of music. He was the first to use the minor seventh free. He had dared to use in his madrigals a series of unprepared dissonances that had shocked the conventional and even professional musicians of his time, but had caught the attention of genuine music lovers. He employed as many as fourteen instruments in his orchestral performances allotting a considerable degree of individuality to each. Dickinson in his *Study of the History of Music** says: "His (Monteverde's) operas are remarkable, in view of their date, for variety of

* The Study of the History of Music with an annotated guide to music literature by Edward Dickinson, Professor of the History of Music at Oberlin Conservatory, Oberlin College, New York, Scribner's 1906.

vocal effect, poignancy of expression in the recitative, feeling for melodious beauty, and particularly for the use of instruments to intensify sentiment and situation. Even modern musicians can understand the strong effect of such musical composition as the lament of the heroine in Arianna, *Lasciate mi morire*, upon the audiences of that day and it is no wonder that the strains are to be found in many collections of old Italian music."

During the seventeenth century the great musicians are all Italian. Those who know the history of music think of Giacomo Carissimi, famous for his *oratorios* and *cantatas*, a master of counter point whose *oratorio* choruses are varied and dramatic even at times realistic. They are among the direct preliminary musical developments that were to come to so fine a climax of expression in Handel. Another Italian composer of this time whose name will always remain a landmark in the history of music is Alessandro Stradella. It was during this century that women began to appear as singers in opera just as toward the end of it they began to appear as players on the stage. The female voice had been excluded from the Church but found a precious opportunity in the theatre and the latter half of the seventeenth century will always be distinguished in the history of music and above all of operatic development because of its introduction of women and the charm of their singing in public performances. As the seventeenth century came to a close the acknowledged head of Italian opera was Alessandro Scarlatti at least thirteen of whose pupils attained European renown as opera writers. He did not invent the *da capo aria*, but he made it the most conspicuous feature of his operas, and as pointed out by Dickinson, "in his works the three movement Italian overture, quick, slow and quick movements, the precursor of the symphony is fully developed."

Scarlatti was undoubtedly a genius of brilliant musical gifts with a marvelous ability for the production of easy tuneful melody. Unfortunately as so often happens, his very facility tempted him to create a formula which he knew how

to use to advantage, but which his disciples abused. Strings of *da capo arias* separated by dry recitative became the stereotyped model which his successors followed for the next century to the serious detriment of Italian opera. Unfortunately also while Scarlatti himself was able to write some really powerful and impressive Church music the decadent operatic music influenced the ecclesiastical music of the time with serious results. While opera was becoming shallow and trivial and a mere exercise of musical ingenuity, Church music too became florid and tawdry and Italy's influence was anything but favorable to the production of good music in any form.

It is as true in musical history as always in the story of art, that when Italy loses taste and becomes superficial and follows a formula — to the inevitable detriment of art — that particular department of aesthetics whatever it may be is sure to be seriously disturbed for the world. Only very rarely does a genius arise in some other country to lift it up. Italy is looked to as the leader and her history shows how well she deserves that respect, though sometimes in the inevitable ups and downs of human affairs her influence is for the worse.

While serious music was thus unfortunately suffering an eclipse in Italy a lighter mode of musical expression was coming into vogue through Italian composers that was destined to play an important role in the history of music. Light opera which in our day has so sadly degenerated into musical comedy originated as a special musical mode in Italy. It can be traced to the primitive popular farces, burlesques, Punch-and-Judy shows of various kinds with musical accompaniments and at times somewhat ambitious choral effects which were popular even back in the medieval period. The use of farce in comparatively modern time in connection with music came first as an *intermezzo* between the acts of serious opera. These interval pieces became so popular, however, that they gradually encroached more and more upon the serious portion of the entertainment until composers came at length to realize that there was a special opportunity afforded them in this musical mode and so what we know as comic opera

or *opera bouffe*, to use the French term, which has sometimes made people think by the universality of its use that the musical mode described by it is French in origin, came into existence in Italy under the title *Opera buffa*.

It was not long before this invention of the Italians was found to afford excellent opportunity for the display of high musical ability. Comic opera acquired, even though the expression may seem to imply a sort of contradiction in terms, a musical dignity of its own among the Italian composers. Naples was the leader in this new development and one of the great Neapolitan composers, Logroscino, is the first great master in this mode. It was not long before *opera buffa* demonstrated that it was a natural and not artificial development of music by demonstrating its superiority to the *opera seria* in dramatic vividness, in truth to life, and in spite of the farcical elements in its libretto, in the fine opportunity that it afforded for genuinely serious satire of the foibles and fads of mankind, if not always of its vices. In this form of opera the bass particularly came to its own. The *ensemble* or *finale* at the end of an act was developed and some very charming effects produced. Our musical comedy is as much a degeneration from this *opera buffa* of the Italians of the last century as our fiction represents a deterioration from the Victorian era of novel writing.

The names of the men who developed *opera buffa* after Logroscino, among them Galuppi, Pergolese, Piccini, Paisello, Cimarosa, will always have a place in the history of music. While serious opera was declining there was a constant advance in this newer mode and as Dickenson says in his Study of The History of Music, Cimarosa's *Il Matrimonio Segreto* is the strongest work of its kind before Rossini's *Il Barbiere di Siviglia*. Indeed it was the enduring value of the comic operas of the eighteenth century in Italy which preserved for the nineteenth century the dramatic traditions of Italian music and thus prepared for the revival of music in Italy in the nineteenth century.

During the past fifty years only has Italy's primacy in

music been seriously disputed, some think successfully by the Germans and French, though the ultimate decision of posterity must be awaited patiently before we can be sure whether the ambitious attempt to co-ordinate music with drama on equal terms is to be accepted at its face value by future generations, or is to prove to have been in reality an unfortunate subordination of a sister art to another, to the detriment of both. Even in this last century however, Italy's contributions to music have been extremely noteworthy and two great Italian composers have achieved world reputation and world popularity. Rossini in the first half of the century was the most influential factor in the world of music of his time. His genius will be best appreciated from the fact that before the age of twenty he had completed five operas. In spite of his rapidity of composition at an age when immaturity seems inevitable, these bore the unmistakable marks of musical genius. The Swan of Pesaro as he was called from his birthplace came not unnaturally to be looked upon as one of the greatest of living composers. His *Stabat Mater* in church music and his *William Tell* in opera were in their time the most popular of compositions. His successor in Italian composition, Verdi, is only less famous than his master. Some of his great operas as *Aida* and *Falstaff* are among the most popular of compositions and rival even the German School of Music in their appeal to this generation. What an immense gap there would be in recent world music if the works of these two men were missing.

Of the lesser Italian composers of the nineteenth century some are greater than any of the composers of other countries except the very greatest. Few men anywhere in Europe for instance have proved a source of so much pleasure to music lovers as Vincenzo Bellini who though he died at the early age of thirty three has left some operas which have not ceased even now nearly a hundred years after his death to be popular. Like Rossini his genius for musical composition developed very early and he was but twenty four when his first successful opera *Bianca e Fernando* was presented.

MUSIC

His version of *Romeo and Juliet* was received with plaudits in 1830 and he was but twenty eight when its reception was prepared for by his *Zaira*. *La Somnambula* and *Norma* were finished before he was thirty and *I Puritani* was presented just before his death in 1835. All of these still hold their places on the operatic stage of all countries not only as old time favorites or chance revivals to please the older auditors, but as regular numbers of the operatic seasons, looked for anxiously by music lovers of all ages and nations.

Scarcely less well known among the composers so far as popularity is concerned is Donizetti who composed altogether some sixty-five operas. All opera goers know his *La Fille du Regiment* which only later came to be known as *La Figlia del Reggimento*. Because of its French title, Donizetti in spite of the frankly Italian form of his name is sometimes thought of as a Frenchman. Undoubtedly his work did deeply influence French music during the first half of the nineteenth century. Donizetti himself was born at Bergamo in Italy and died there. His *Lucia di Lammermoor* is a favorite and his *Lucrezia Borgia* in spite of its utterly absurd perversion of history, and *L'Elisire d'Amore* are frequently revived. Those familiar with musical history know his *La Favorita* and his *Don Pasquale*. He influenced modern music deeply and indeed most of the operatic composition of the second half of the nineteenth century, until Wagner's influence came to be felt, was dominated by Donizetti, Rossini and Bellini.

In the very recent times two at least of the Italian composers have probably attracted more serious attention from music lovers in our generation than any of the men who were writing music in our period. These two are Mascagni and Puccini. Mascagni's *Cavalleria Rusticana* had a distinct immediate success all over the world and though he did not fulfill the promise of his early efforts he is one of a very few composers of our time who are known beyond the bounds of their own country. Puccini's work is of course well known by all opera goers and if not greatly admired by musical

amateurs it is at least the most popular music of our time. We are in the midst of serious decadence in music as in all the other arts just at the present time, but at least some of the best work that is being done such as it is comes to us from Italians.

A very striking appendix to Italian achievement in the making of music is formed by the story of their relations to the invention and improvement of musical instruments as well as the development of great singers and performers on musical instruments of whom, almost needless to say, the Italians until very recent years have had more than any other nation. Such accomplishments are of trifling significance compared to musical composition, yet as illustrating the genius of the people they may be worth while recording briefly.

The inventions of musical instruments in Italy show the inventive ability as well as the genius for music of the Italians. The organ was greatly developed by them in connection with ecclesiastical music during the Middle Ages. The violin came into its present shape in Italy about the middle of the sixteenth century. At Bologna, Brescia and Cremona magnificent instruments were manufactured during the next century. The famous names of makers are of course Italian, Amati, Guarnieri, and Stradivari. Their instruments still command high prices and a Stradivarius is looked upon as a precious treasure. There probably has been no single development of music ever made that has added more to the enjoyment of mankind than this evolution of the violin up to a point beyond which it seems as though it will never be carried. It is one of the most charming of musical instruments, and one of the most simple; it is comparatively inexpensive, it may be enjoyed alone or in small companies though it may delight huge audiences and taken all in all it represents one of the supreme advances in instrumental music.

The Pianoforte does not owe as much to the Italians as the violin, the Germans and French having done very much for it and yet the one invention that did most to make the piano as

we now know it, a finished musical instrument, is the hammer action, which was invented by Bartholomeo Christofori in 1711.

Among the great Italian violinists are Corelli and Tartini the first great violinist known to musical history and Paganini who is looked upon usually as one of the greatest of violinists who ever lived. Sgambati is another distinguished Italian violinist very well known and some of whose compositions are still frequently rendered by violin virtuosos, in concerts. Fritz Kreisler's programs of the New York Symphony Society often include pieces by Corelli and Tartini, though it might be thought that the development of the violin music in recent years in other countries, would have left these older composers in the background and surely without much interest for our time.

It is surely no mere accidental circumstance that Italy has developed more great singers, especially more great possessors of the three all important voices, soprano, tenor and basso than any other nation. The musical taste of the people of the peninsula has always been looked up to as almost infallible. Whatever of music itself or voice or chorus has made a success in Italy has almost without exception been accepted without further question in other countries. To come from Italy with the prestige of a distinct success scored in one of the great theatres of the Italian cities is almost infallibly to be sure of a hearty reception elsewhere. The judgment of the audiences of the great theatre of La Scala at Milan has come to be looked upon as probably the least liable to mistake of any in the world.

In a word in every way the world of our time still pays its tribute to the Italians in music, employing their terms, repeating their operas, welcoming their singers, accepting their judgments, so that there can be no doubt at all of the thorough going recognition on the part of all the civilized nations of the immense debt which civilization owes to Italy in this department.

ARTS AND CRAFTS

AFTER a rather long period of comparative neglect, the cult of beauty in the ordinary things of life, even for house furnishings of all kinds as well as the familiar objects of the home, has developed again in our generation. The taste of generations immediately preceding our own in this regard was very low. Very little attention was devoted to having the every day things of life beautiful as well as useful. Mr. Yeats, the Irish poet, once said "no nation can think of itself as cultured until the very utensils in the kitchen are beautiful as well as useful." This is an extremely interesting standard of culture, very different from that which has prevailed at many times in history and particularly in recent years, but it is one that will commend itself to thoughtful people. The "arts and crafts" has come to be the term by which the making of the ordinary things of life, furniture, wall coverings, tableware, rugs and carpets, beautiful as well as useful, is designated. The term meant very little for us until comparatively recent years. William Morris, a generation ago, waked England up to the lacuna in life which had been allowed to develop in this. Appreciation of the place that the "arts and crafts" should have in life has gradually arisen in our time and with it additional interest in the history of this movement in older times.

Almost needless to say many of the most important chapters in the history of "the arts and crafts" have had their evolution in Italy. From the very earliest historical records that we have the inhabitants of the Italian peninsula have been famous for their ability to make beautiful things. Some of the jewelry found in the old Etruscan tombs of the sixth

and seventh centuries B. C. is extremely beautiful, indeed has probably never been excelled in charm and there are other remains in connection with these ancient Etruscan burying places, which have revealed to a modern incredulous world evidence of high artistic taste and marvelous ability to express their artistic ideas among this people from whom we expected so little. As their inspiration was probably independent of Greece for some of the most interesting Etruscan remains date from before Grecian artistic development, they illustrate very well Italy's own original initiative in art matters. It is true that as was surely the case in Greece the ancient people in Etruria may have been influenced by Crete which in recent years we have come to recognize as the historic intermediary of civilization between Egypt and the peoples living along the north shore of the Mediterranean. Unfortunately we have as yet no clue to the mystery of the old Etruscan language and as a result many things that will probably make their art and its origin and meaning much clearer to us are still concealed from us.

The Romans in their early history were warriors; nothing more. The later Romans when culture came to them, were mainly imitators in art, but their reproductions of not a few of the masterpieces of Greek sculpture did much to preserve at least some of the spirit of these for the wonderful outburst of artistic development which followed the rediscovery of the Roman specimens during the Renaissance period. The world owes them a large debt for this if there were nothing else. Even almost in our time Lessing's book on the Laocoon and Roman influence on Goethe did more than anything else to bring about the later German Renaissance. Rome itself at least so long as the Republic endured, was much more occupied with the arts of war and of government than the more intellectual arts. Indeed there seems no doubt that during the centuries while Rome was acquiring dominion first over Italy and then over the world her people were paying almost no attention at all to art and the intellectual life. When Coriolanus went over to the Volsci and came

very near bringing about the destruction of his native city Rome, it is probable that Rome was little better than a collection of huts, while even the scanty remains we have of the Etruscan cities show us that they must have been on a rather high plane of civilization. When Rome captured and destroyed Carthage, that capital of North Africa was probably the most charming city in the world, of the time, wonderfully handsome in its architecture, a veritable city beautiful in many ways and Rome itself was a very sordid mean little town occupied with the one idea of war and paying little or no attention to the things of the mind.

When Rome's time came however, after her conquest of the world and above all after she had vanquished Greece, she fell in love with the Grecian arts and "captive Greece took her captor captive." Then there began for the Romans the development of at least an imitation of Greek art, well worthy of admiration. There are no monuments of this until almost the time of Christ, but there are Roman remains from Pompeii and Herculaneum that are most interesting and have deeply influenced the modern world.

That a little town of only some 14,000 inhabitants like Pompeii, even though it were a sort of summering place for wealthy people, should contain at this time, a little after the middle of the first century after Christ, all the beautiful things the remains and traces of which are to be found at Pompeii, decorations, mosaics, urns, pottery, small statuary and other evidences of successful devotion to a high ideal in the arts and crafts must make us conclude that Rome herself and some of the larger cities of Italy could not fail to have had many beautiful examples of all these various kinds of art work. What we learn of the garments of the Roman women during the Empire would seem to indicate that there must have been much of taste as well as of lavish display in the dress of the Romans, and not a little of beautiful needlework for personal and home decoration; though Rome doubtless drew on the East and Oriental sources for these purposes as it did on its Grecian sources in the higher arts.

It is sometimes thought that during the earlier Middle Ages all serious attention to the cult of beauty for its own sake above all for domestic and familiar surroundings was lost. As a matter of fact Byzantine art included the development, particularly of decorations, in such a way that with our own reawakened interest in interior decoration we have gone back to take up seriously many of their artistic modes. Above all in the use of mosaic they excelled. The formalism and massing of colors which created such fine decorative effects, but the appreciation of which was lost in the modern world until comparatively recent times, are now come to be looked upon as qualities of high artistic effectiveness. The use of gilt and gold ornaments in connection with decorations and of raised work in intimate relation to flat decorations also jarred on modern notions, until the deeper study of decorations by the latest generation of artists has brought with it a recognition of the good taste even in these matters of the older medieval artists. Sargent went back to this mode in the Boston Public Library. In the chapter on Architecture I have called attention to the fact that the tomb of Pasteur a great scientist of the later nineteenth century is decorated in imitation of the tomb of Galla Placidia at Ravenna of the seventh century.

The triumph of Byzantine decoration is St. Mark's at Venice. Glass making was always a specialty of Venice and so it is not surprising that they made the magnificent glass mosaics for the walls of St. Mark's which still continue in undimmed lustre to show the artistic quality of medieval art and above all of Byzantine forms. From the tomb of Galla Placidia at Ravenna to St. Mark's is five centuries and it is quite fair to assume that in no century of the interval was Italy without the spirit and the power for beautiful interior decoration. Floor and wall mosaics have continued to be a specialty of Italy ever since. For centuries there was always a studio and manufactory of mosaic at the Vatican and the old-fashioned art so eminently valuable because of its enduring qualities has never been permitted to sink into oblivion.

There are of course scattered all over Italy magnificent mosaics which now that we are beginning to cultivate the feeling for beauty in every part of our public and private houses serve as models for our modern workmen. Our great hotels particularly find in Italian sources examples that can be copied with great effect and which eminently represent beauty and utility.

With the coming of the earlier Renaissance in Italy everything that was made particularly for public or semi-public use took on beauty as well as utility. The doors of the Baptistry at Florence are a typical example. Doors might very easily be looked upon as necessities to be treated almost entirely from the standpoint of their adaptation to their purpose. For the Italians however, they became literally the finest opportunities for marvelous works of art. While the Florence doors are so well known it must not be forgotten that in many other parts of the Italian peninsula there were handsome bronze doors, amply fulfilling the rule of combining the useful with the beautiful.

The woodwork of the churches was beautifully carved. The stone work was sculptured into charming designs. The iron railings and the hinges and bolts and the locks and even the keys became the subjects of artistic handicraftmanship of the highest order. Nothing in connection with their beautiful temples to the Most High could be insignificant. Every portion clamored to be made beautiful as well as useful. The people felt that these Churches were theirs and were made almost without exception by their fellow townsmen; so their attitude toward the art in them was very different from that which the visitor almost inevitably assumes toward the art objects in the modern museums. They had something very similar to that personal feeling of possession and enjoyment which the collector who is a real amateur enjoys. Day after day they saw and handled — which they are so carefully invited not to do in the modern time — these charming artistic objects. No wonder that Italy became the treasure house of medieval art and the quarry out of which many other

ARTS AND CRAFTS

nations have obtained the materials for their museum collections and the models of the beautiful things that with our awakened taste for art, we are coming back to look for in the modern time.

Literally all the objects in the churches were affected by the taste of the Italians. The vestments used in religious ceremonials came to be such beautiful examples of needlework that they have been famous ever since. Some years ago the American public heard that Mr. Pierpont Morgan had purchased the famous Cope of Ascoli. He paid a very substantial sum for it because experts assured him that it was the most beautiful piece of needlework in the world. Later it was found that the Cope had been stolen from the little Convent of Ascoli in North Central Italy where it had been made toward the end of the thirteenth century. Mr. Morgan gave it back to the Italian government, but not until the story of it had awakened general interest in this magnificent accomplishment with the needle of the nuns of the later Middle Ages. Almost needless to say this is only one of many such examples of Italian needlework that share in the beauty of the arts and crafts work of that time. Nearly everywhere in Italy Cathedrals and Convent Churches possessed beautiful examples of needlework done for vestments that lifted what seems a mere handicraft up to the level of real art. Modern auction rooms have made our generation familiar with these objects and they command prices that seem almost incredible but that are only a deserved tribute to the thorough going artistic spirit in which they were conceived and executed.

After the vestments the greatest attention and devotion was given in making the books used in the religious services beautiful. As a consequence illumination of manuscripts became one of the arts to which Italians devoted themselves with passionate ardor. Some of the illuminated missals and Books of Hours of the later Middle Ages are among the most beautiful examples of book-making that can well be conceived. Executed on enduring parchment in colors that have not

faded in many hundreds of years these triumphs of the art of the Italian illuminators fortunately remain as monuments to tell of their skill. Their blues are as permanent as their burnished gold, though we have lost the secret to a great extent of keeping either of these modes of decoration up to their original coloration. Our blues fade, our gold dims. The number of designs, each original, often in charmingly beautiful detail, which the Italians made for their religious books shows how deeply their artistic sense was touched and how literally it was true that for them a thing of beauty was a joy forever.

It is not surprising then, after this beautiful book making by hand, that when printing was introduced, Italy at once took up the new craft and lifted it to the plane of an art. Some of the most beautiful books that have ever been made were finished in Italy during the first century after the invention of printing. They invented fine faces for the printed letters, adjusted the spacing and the size of margins so as to make an artistic page, made serviceable and enduring paper and then bound the books handsomely and suitably in all manner of beautiful bindings. When some three centuries later printing had sunk into a decadence that made the books of the middle of the nineteenth century so shameless in their cheap effrontery, a modern renaissance of beautiful bookmaking occurred through the study of the handsome books that had been made by the Italians during the Renaissance. When William Morris toward the end of the nineteenth century wanted to restore bookmaking to the plane of an art from which it had been dragged down by the commercial printer and publisher, he chose some of the old Italian books and imitated them in making the well-known issues of the Kelmscott Press which now sell in the auction rooms almost as dear as the originals. One of the first great book collectors of modern times, Thomas Maioli, an Italian, had the famous inscription on his books *Tho. Maioli et amicorum*, declaring that the books belonged not alone to their owner but also to

ARTS AND CRAFTS

his friends. These Italians had the true community spirit. Anyone willing to share his books has.

The wonderful Missals and Books of Hours of the old church services proved an inspiration to the early printers but not more than the beautiful vestments were for everything else used in the churches and then their influence extended to the things of ordinary life. The bells and gongs of ceremonial usage were made with an eye to their beauty, always as well as their utility. The cruets for the wine and water of the sacrifice and the various sacred vessels, chalices and ciboria came to be made with the highest artistic skill. Ostensoria for the exposition of the Host gave excellent opportunities for fine art work. The vases for flowers on the altar and the candlesticks, the sculptured or carved details of the altar itself, the worshipping angels, the tabernacle and the canopy above it all these were treated with eminent artistic ability. Our churches are only now beginning to imitate in some way what these old medieval cathedrals and above all the monastic churches did so well. Of course besides great artists were invited to decorate the wall spaces and magnificent pictures were secured as further decorations. And all this was visited Sunday after Sunday and nearly always one day in the week besides, by all of the people who lived in the neighborhood, until they were as familiar with all of it as with the objects in their own homes.

While so much of attention was devoted to the altar, other objects within the Church did not suffer and indeed sometimes for personal reasons took on special art qualities that made them monuments of the artistic taste of the time. Monarchs were buried in magnificent tombs in the Churches and great sculptors were summoned to fitly commemorate the dead rulers. In many ways then their Churches became educational factors for history and furnished stimuli to their knowledge of their country and its rulers. Besides distinguished men of all orders found their last resting place within the Church and the records of their deeds were chronicled fittingly on their tomb stones. Many of these tomb stones

became the subjects of artistic engraving that has given them a special interest in the modern time. Stone, bronze and brass were used effectively and even when set into the pavement to be trodden on lacked not in beauty. The very grave yards, as the Campo Santo, in Pisa, became museums of great art in which the people at the impressionable times when they came to be with their dead, found the religious motives that mean so much for life pictorially represented on the walls around them in paintings that are still the subject of the admiration of artists from all over the world.

The choir lofts and singing galleries were not only worthy of the rest of the sculpture decoration of the great churches, but sometimes rival even the high altar in the excellence of their artistic quality. The famous singing galleries of the Duomo at Florence made by Luca della Robbia and Donatello, which are unfortunately no longer to be seen in the great church itself, but in the Museum at the Eastern end of it, are typical examples of how seriously such a comparatively humble portion of the Church, so far as its connection directly with the ceremonies was concerned, was taken in its relation to art, at this time. The Italian pulpits are of course famous all over the world. What the Pisanis did at Pisa, and at Siena are well known. Copies of the pulpits from these two cities in the full size of the originals are to be found at the present time in many modern museums far distant from Italy. The sculptured decorations in connection with these two pulpits were beautifully done and have been the subject of loving study by sculptors and artists all over the world whenever there has been an awakening of the art sense ever since. How beautiful these works are only those who have made special studies of them and who are themselves possessed of critical artistic faculty of high order can properly tell us.

Practically everything connected with Church services became subjects of loving artistic workmanship. Once it is realized what their Churches meant for the medieval people the true significance of this devotion to art in everything con-



SINGING BOYS

Donatello 1386-1466

nected with them will be more readily appreciated. Literally all the people went into the Churches many many times every year. By the law of the Church they were required to hear Mass on all Sundays and Holy Days of obligation. In the later Middle Ages the number of holydays of obligation was almost as great as that of the Sundays. This number varied in various places but it was probably never less than forty and sometimes larger. Probably therefore a hundred times every year at least, practically everybody went to Church. If this should seem too great an assumption it may be well to call attention to the attendance of Catholic Churches in our own time and comparatively how few Catholics there are who do not go regularly to Church. In the days when to stay away made one a marked individual and when absence was so readily noted and therefore public opinion and human respect confirmed Church law, there must have been almost universal attendance.

It is easy to understand then what an education in art, and what a feeling for beauty must have been produced among the people by such frequent association with art objects of high quality. We are spending large amounts of money in the creation of museums and the collection of art objects of all kinds, some of the most precious of which come from Italy of this later medieval period of which we have been talking. We have the feeling that such expenditures will be amply repaid if only our people can be brought in real touch and true sympathy with good art. Out of our whole population, however, comparatively few go to our museums and even those go rather rarely. It would be interesting to be able to calculate what proportion of our people in New York City go to the Metropolitan Museum more than once a year and perhaps still more interesting to know how many go there of their own initiative and not because a friend from out of the city must be taken to see the sights.

Weekly attendance or oftener in a building containing on all sides the objects that now are collected so assiduously and with so much expense for our museums, must have proved

a great education in good taste and been a real cult of beauty for all the people who could possibly have any appreciation. They were literally steeped in an atmosphere of artistic quality and fairly forced to learn as far as such learning is possible the meaning of beauty in life. Even such favorable surroundings would not produce an art sense if it were not already present nor create a taste, but it would marvelously stimulate all the artistic qualities that were present. Hence it is not surprising that Italy continued for centuries to be a magnificent home of the artistic arts and crafts and that these affected every phase of existence and all the objects that men used.

A typical instance of the devotion of the Italians to the making of things beautiful even though they might seem to other peoples too trivial for artistic effort is to be found in the career of Benvenuto Cellini. Nothing came amiss to his artistic hands provided it would be reasonably well paid for and he had liberty to execute it as he saw best. All over Europe there are well authenticated specimens preserved of smaller pieces, even table ornaments and utensils made by his hands. There is a gold salt cellar in Vienna, a bell in the Rothschild collection, the beautifully chased armor of Charles IX of Sweden to be seen at Stockholm, a series of beautiful seals, a collection of magnificently executed medals and a large number of coins designed for the Popes and for the Medici family. No form of plastic work was strange to him. He did the magnificent crucifix in white marble which was presented to Philip II of Spain by the Duke of Florence and is one of the most precious treasures of the Escorial. There is a shield elaborately wrought by him which is an equally precious treasure at Windsor Castle.

The typical attitude of Italian artists toward the arts and crafts is to be seen in a great series of tapestries made for the Sistine chapel. At the request of the Pope the cartoons for these tapestries were drawn by Raphael. In the modern time one might possibly think that a great artist would refuse to devote himself to work of this kind in which

his designs were to be expressed only by colored threads and the mechanical process of weaving. Above all since by the conditions of the work his cartoons would have to be cut in narrow strips to be distributed to the weavers, it might be anticipated that the artist if for some reason quite apart from his love of art he took up the making of the designs would not give his best energies and artistic inspiration. Raphael's cartoons, however, for these Sistine Chapel tapestries discovered in narrow rolls in the store rooms of the Flemish Tapestry manufactory long afterwards, are now perhaps the most precious treasures of the South Kensington Museum and illustrate very well how much the Italian spirit favored the idea of having everything, even the hangings of a distinguished structure as beautiful as possible.

With the revival of interest in classical antiquity in the Renaissance there came also a renewed devotion to the making of artistic jewelry and the carving of gems under the inspiration particularly of the Greek gems that had been preserved. Jewelry became something more than merely a costly ornament and rose to the plane of an art. Until comparatively recent years our generation was content with wearing precious stones as adornments. The only attraction possessed by these is their costliness and a certain childish liking for shining things that survives in most of us but is really primitive and barbaric. Artistic jewelrý, however, produces not the sense of envy which precious stones inevitably arouses and for which they are really worn, but a genuine feeling of pleasure due to the fact that a thing of beauty is a joy forever, and that above all whatever has been made beautiful by the hand of man always evokes man's admiration. The Italian Renaissance gems and cameos are deservedly famous and served as a stimulus and provided models for gem cutting in other countries of Europe. Some of the Italian Renaissance gems rivalled the antiques so closely as at times to be taken for antiques. For most of the centuries since, Italy has retained her primacy in these arts

and it is mainly from there that the most beautiful gems and cameos and present day jewelry are obtained.

In the Renaissance time the arts and crafts in Italy were applied not only to churches and public buildings, they were brought close to life in every way. Homes were made beautiful, private apartments rendered charming by the designs of great artists and they were invited particularly to make living rooms models of artistic beauty and especially was this true for the living rooms of the ladies of the times. A typical example of how thoroughly this work was done is afforded by the models of the private apartments, *camerini* as they were called, of some of the palaces of this time, which public museums in our day are engaged in reproducing. The apartment of Isabella D'Este, reconstructed for exhibition in the Museum at South Kensington, London, makes it very clear what a charming retreat Isabella made for herself at the time when her position as Dowager Duchess gave her the leisure as well as the opportunity to devote herself to the construction of an apartment which should reflect her personality. This has been described in some detail in one of the manuals on interior decoration issued by the museum.

In the grotto on the ground floor were collections of art in which she accumulated statues and rare objects and even added a cortile with fountains playing during the Summer-time. This was for the large receptions when princes on their travels, ambassadors on their missions and travelers and artists of distinction came to visit her.

There were three new rooms at the top of the Palazzo which were made particularly for her own delectation. They were known as the Paradiso and they reflect their mistress' many sided interests in the arts. Some paragraphs from the South Kensington Art Handbook, already mentioned, on Italian wall decorations of the fifteenth and sixteenth centuries, will give the best idea at once of the tastes and of the much deeper than amateur interest that Isabella must have had to succeed in surrounding herself with so many things that are of enduring artistic value.

ARTS AND CRAFTS

“The first room was dedicated to music, the favorite pursuit of Isabella. The cupboards were filled with beautiful instruments: mandolines, lutes, clavichords, inlaid with mother of pearl, and made specially for her by Lorenzo of Pavia; and here stood the famous organ by the same master, the description of which is to be found in the princess’ correspondence. Round the walls of this first room were reproduced views of towns in ‘intarsia’ of rare wood and on one of the panels figured a few bars of a ‘Strambotto,’ composed by Okenhem to words dictated by Isabella, and signed by that famous singing master. On the ceiling was the ‘Stave,’ which exists in the coat-of-arms of the House of D’Este, and along the cornices friezes were formed of musical instruments carved in the wood.

“In the second room, devoted to painting and also to study, six masterpieces by the greatest painters of the time adorned the walls above the panelling.

“The third room was reserved for receptions. Everywhere in the ceiling, in the compartments, in the friezes (delicately carved in gilded stucco upon an azure background) are found the devices commented on at length by the humanists of her court: ‘Alpha and Omega’ and the golden candlestick with seven branches, on which a single light has resisted the effects of the wind, with the motto, ‘Unum sufficit in tenebris;’ and everywhere is to be read the mysterious motto of which she was so proud, ‘*Nec Spe nec Metu,*’ the highest resolution of a strong mind, which henceforth ‘without hope, without fear,’ ended in solitude a tormented life. In the recess of the thick wall slightly raised above the floor, Isabella placed her writing table within reach of the shelves containing her favorite books; while she read there or wrote those letters addressed to the poets and artists of Italy, overflowing with enthusiasm for arts and letters, when she lifted her eyes beyond the tranquil waters at the mouth of the Po, towards Governolo, she would see coming the gilded Bucentaur with the coat-of-arms of Ferrara, which brought her news of her family, D’Este, and that of Aragon.”

This was only an example and there were many other apartments rivalling to some degree at least these *camerini* of Isabella D'Este. Her sister-in-law, Lucretia Borgia, of ill fame, but whose name has been so thoroughly vindicated in recent years, is said even to have excelled Isabella D'Este by the charm of the apartments which she had decorated for herself. Unfortunately these apartments were destroyed by fire in 1634, but the reputation that they enjoyed as excelling Isabella's and the fact that they had been adorned with paintings by Bellini, Titian, and Dosso Dossi, fitted into recesses of white marble, carved by Antonio Lombardi, is quite sufficient to make it clear that their reputation was well grounded. The rooms of these *camerini* were of rather small size, real living rooms and not at all the formal reception rooms of the palace. They were sanctuaries of art and of literature with selected libraries of chosen volumes and fine bindings and of music with beautiful musical instruments.

Every phase of life had its contribution from the art of Italy. Beautiful glass of all kinds has been a tradition at Venice and the Venetian glass of the later Middle Ages and the Renaissance is still looked upon as admirable, so tasteful and thoroughly artistic was the work of these Venetian glass makers.

There is not a single phase of the arts and crafts in which Italy and the Italians have not been pioneers for the modern world at least. In most phases of the arts and crafts they have been ever so much more than pioneers for they have carried out their inspiration so completely that they have accomplished some of the best work ever done in many special lines. That is the real reason why art objects from Italy command such high prices in the auction rooms in our time. Our generation has come very definitely to the persuasion and is quite willing to recognize that Italy can provide the best models for us in this regard and we are willing to pay for them. The movement itself is only just beginning, however, and a great many of our people have not yet awakened to the realization of the growing admiration that there is in the



TITIAN, EMPEROR CHARLES V.

ARTS AND CRAFTS

minds of those best capable of judging, for what the Italians have accomplished in this regard. Italy is far more important than any other country in the arts and crafts and has such an immense precious treasure of beautiful objects from many centuries that even the sales for years will not make the treasure house of Italy much less valuable for the visitor than it has been.

The Italians not only made their homes beautiful but also made the surroundings of their dwellings as charming as possible. In recent years we have heard much about the Renaissance gardens and above all various forms of Italian gardens, because we ourselves are gradually coming to the place where we can live under conditions that provide enough room to have a garden around the house. The automobile is enabling people to live in the suburbs and as a result the women of our time have become very much interested in the formal garden. The best models come to us from Italy and our magazines have published many articles with regard to them. Whether the garden is to be small or large, to have vistas and water scenes of various kinds, or whether it is to be mainly a question of flowers and shrubs and trees, the Italians have worked out the most beautiful ideas and it is always worth while knowing what they accomplished. Probably no one knew better how to combine statuary and various artistic decorative effects with shrubbery and garden vistas and sunken garden plots and falling water where sound and vision both combine to give pleasure, than these Italians.

LITERATURE

ITALY has been the home of two great literatures, the Latin as well as the vernacular Italian. The peninsula is the birthplace of the older Latin literature of the classical period and must be credited with the gift of that to civilization. The great Latin verse and prose of the first century before and after Christ are truly Italian in origin. We are prone to think of this Latin literature as Roman but the great writers of Rome were almost without exception born outside the city in various parts of the peninsula. As is so true in great city life at any period in history, the intellectual leaders in the Roman capital were the sons of country folk as a rule, born far from "the madding crowd" of city life, or at least brought up in smaller towns where existence was not too strenuously full of excitement to keep man from thinking. Like many a budding genius of the modern time, these poets and literateurs who were to be called Romans because the city greedily swallowed them, went to the metropolis to make their way when they felt the first stirrings of their talent within them.

This picture of history is so characteristically exemplified at Rome that scarcely a single one of the best known Latin authors was born in the city itself. Even that stern old Roman, the elder Cato, was born at Tusculum. Ennius long before had been born at Rudiae in Calabria. Plautus, the typical Roman dramatist was born at Sarsina in Umbria. Livy was born up at Padua and in the eyes of the critics at least never quite got over a certain provincialism of style which they called Patavianism, from the Latin name of his birth place. Virgil was born up at Mantua, Horace up on the Sabine farm, the Plinys both at Como, Catullus at Verona,

Cicero at Arpinum, Persius in the Hill Country where probably Juvenal also was born, and Ovid at Sulmo. The whole Italian peninsula was represented in the old Latin literature. How much the world is indebted for this classic Latin literature to the foster land of it would be hard to tell.

As always throughout this book this antique claim of Italy is waived with just a mention of it, though it must not be forgotten that there is besides the classic Latin a modern Latin literature for which the world is more deeply indebted to the Italians than to any other nation. This Latin literature which used to be rather contemptuously spoken of as medieval Latin, has come into its own of appreciation during the past generation. Its verse consists of the Latin hymns of the church services and its prose of the great tomes in Latin of the philosophers and scholars of the later Middle Ages, as well as of the Renaissance period. Professor March whose studies in philology give him a right to an opinion in the matter, has suggested that the Latin hymns are the true Latin folk poems, representing the genius of the Latin tongue much better than the classical poetry, so much of which was in imitation of the Greek. He did not hesitate to say that "For inspiring and elevating thought and for vigor, harmony and simplicity of language the Latin hymns are better than any Augustan odes." They have been well called, as he tells us, "the Bible of the people" and they have ever so much more of the Bible's literary merit than most people were accustomed to think until the more careful study of them in recent years brought them back into proper appreciation.

The greatest of these Latin hymns which constitute a supremely important contribution to world literature, we owe to the Italians. In proof of this I need only cite the *Dies Irae*, the *Stabat Mater*, Aquinas' great hymns, and those attributed, rightly or wrongly to Ambrose and Augustine, and which were certainly due to their disciples. The greatest of these Latin hymns is universally conceded to be the *Dies Irae*, probably written by Thomas of Celano, the biographer of St. Francis of Assisi, whose life of Francis is one of the

important works of the Latin prose of his time. Professor Saintsbury of Edinburgh, whose prestige as a critic of world literature gives his opinion great weight, goes so far as to say that there was probably never a more wonderful wedding of sense and sound than is to be found in the *Dies Irae*. The supreme tribute to it is the number of translations into every language that have been made, a great many of them by men distinguished for their own poetic genius and thorough-going capacity to appreciate poetry. More of these translations have been made during the past hundred years or so than at any time during the nearly seven hundred years that have elapsed since the *Dies Irae* was originally written. Not a few of the translations have been made by men who were far from being particularly noted for their piety and some of whom indeed were rather well known for the opposite. Goethe and Byron are in the list, but many another rather free living and free thinking poet in the last three generations has tried his hand at providing a worthy setting in his own tongue for this greatest of religious poems ever written. We have literally hundreds of English translations, some of them extremely well done, though the task is about as difficult as it can be.

Scarcely less great as literature and poetry is the *Stabat Mater Dolorosa*, usually attributed to Jacopone da Todi. Rivalling this in poetic quality and approaching even the sublime *Dies Irae* in their marvelous expression of sublime religious truths in charmingly beautiful language, so touched with emotion as to be real poetry, are the great hymns written by St. Thomas Aquinas for the office of the Blessed Sacrament. Some of St. Bonaventure's great hymns, though not so well known, are only next to those of Aquinas in charm and beauty. From the original cultivation of this form of poetry under the patronage of St. Ambrose at Milan in the fifth century, for nearly a thousand years there were a series of magnificent contributions made by Italians to this mode of literature. There were literally thousands of hymns, though only com-

paratively few are known and only those which are frequently used in the Church services are properly appreciated.

The Latin prose written during the Middle Ages by the Italians, though the subject of not a little contemptuous scoffing on the part of the Renaissance writers for whom Classic Latin was the supreme ideal, was a vivid vigorous language, much of which was destined to live and influence men more deeply than the elegant stylism of the post-medieval Latinists. This Latin prose consists of such books as Thomas of Celano's Life of St. Francis, already mentioned, and a number of lives of saints written by those who knew them well, as well as such descriptions of saintly living as are to be found in books like the Little Flowers of St. Francis which it must not be forgotten was originally in Latin. Many editions of these books have been issued in recent years and not always because of their religious character but because of the naïvely beautiful human appeal which they contain.

Then there were monastic chronicles some of which are very wonderful in their simple relation in humanly sympathetic fashion of the events of the older time. They were materials for history rather than history itself, yet often with more literary flavor to them than much more ambitious historical writing of quite recent date. A series of encyclopedias such as that of Thomas of Cantimprato must not be forgotten and finally the philosophic works of the great teachers of philosophy constitute a magnificent contribution to prose often of true literary quality. The language in which the scholastic philosophy was couched has, until comparatively recent years, been spoken of quite contemptuously by men of the after time who had only dipped into it slightly or knew it only at second hand, but never by anyone who really knows anything about it. The man who despises scholastic philosophy and its style has either never read it, or having tried to read it and found it very difficult, has concluded that of course the difficulty must be in the style and not in himself, either his power of application or of understanding. As a matter of fact no language has ever been developed to the point of expressing

so exactly the meaning intended to be conveyed with the nicest accuracy of distinction as the Latin of the scholastic philosophy. It owes more to the Italian philosophic writers, to Anselm the founder of scholastic philosophy, to Lanfranc, to Peter Lombard, above all to Thomas Aquinas than to any others.

Prof. Saintsbury of the University of Edinburgh whose studies in the European literatures of all the modern times gives him the right perhaps more than anyone who writes English in our day, to express an opinion in the matter, does not hesitate to say that the influence of this scholastic Latin on the modern languages which were coming into existence during the thirteenth and fourteenth centuries was most happy. The passage of comment on it from his "The Flourishing and the Rise of Allegory" the first of the volumes of his *Periods of European Literature*, deserves to be quoted here because it places squarely before the reader the authoritative declaration of a great modern critic, a profound student of the literature of the world, as to the value in mere style of scholastic writing, an element that has been often quite missed or sadly misunderstood.

"The claim modest and even meagre as it may seem to some, which has been once more put forward for this scholasticism—the claim of a far reaching educative influence in mere language, in mere system of arrangement and expression, will remain valid. If at the outset of the career of modern languages, men had thought with the looseness of modern thought, had indulged in the haphazard slovenliness of modern logic, had popularized theology and vulgarized rhetoric, as we have seen both popularized and vulgarized since, we should indeed have been in evil case. It used to be thought clever to moralize and to felicitate mankind over the rejection of the stays the fetters, the prison in which its thought was mediævally kept. The justice or the injustice, the taste or the vulgarity of these moralizings of these felicitations, may not concern us here. But in expression as distinguished from thought, the value of the discipline to which these youthful

languages were subjected is not likely now to be denied by any scholar who has paid attention to the subject. It would have been perhaps a pity if thought had not gone through other phases; it would certainly have been a pity if the tongues had been subjected to the fullest influence of Latin constraint. But that the more lawless of them benefited by that constraint there can be no doubt now. The influence of form which the best Latin hymns of the Middle Ages exercised in poetry, the influence in vocabulary and in logical arrangement which scholasticism exercised in prose are beyond dispute, and even those who will not pardon literature, whatever its historic and educative importance may be, for being something less than masterful itself, will find it difficult to maintain the exclusion of the *Cur Deus Homo*, and impossible to refuse admission to the *Dies Irae*."

The first great beginnings of Italian literature in the vernacular came in the songs of the Troubadours or Trovatore before Dante. Men like Sordello or like Dante's teacher Brunetto Latini or his friends Cino da Pistoia, Guido Cavalcanti and Dante da Maiano, wrote lyric poetry of a high order in Italy before the close of the thirteenth century. Dante himself was in his younger years just one of these lyric singers of a day. Had he not lived to write the Divine Comedy he would be known as one of the Italian *Trovatore* and perhaps not the greatest of them, though there is no doubt some of the lyric poetry of his younger years is worthy of very high consideration, while that of his friends about the same time represents a real outburst of true poetic quality in lyric song. Some of Dante's sonnets are among the greatest poems ever written in this form.

As for the Divine Comedy the only danger is in underestimating its value, it is scarcely possible to exaggerate its worth to mankind. There are not a few people in our time who seem inclined to think that there is more or less of a convention among those who are dissatisfied with our own period and have been taking up with older times, to praise Dante very highly, as if that somehow justified their disagreement

with the generality of mankind on human values present and past. For them this praise of Dante seems utterly exaggerated and perhaps due to the fact that he is not very easy to understand and that incomprehensibility is therefore taken for sublimity. Tacitus said *omne ignotum pro magnifico*, what is unknown is often thought to be great by humanity and this would for some people seem to be the root of Dante's reputation. Those who need authority however to back them up in an opinion with regard to the height and depth of Dante's poetic quality, can find it without difficulty and indeed need not go beyond our own English writers in what is practically our own generation. They will find it so abundant and so emphatic in the mouths of men whose modern interests were entirely different from those of the medieval poet in religion and politics that there can not be the slightest doubt of the absolute sincerity of it.

Dean Milman declared that "Christendom owes to Dante the creation of Italian poetry, through Italian of Christian poetry." While Dean Milman has above all in his commentary on the place of Dante's *Paradiso* as one of the sublimest of human expressions shown how highly we should appreciate the Florentine's poetic sublimity, perhaps the comparison of Dante with Tacitus will show better Dean Milman's interest and estimation, for as an historian Tacitus must have been one of his favorite subjects of study as an ideal.

"To my mind there is a singular kindred and similitude between the last great Latin and the first great Italian writer, though one is a poet and the other a historian. Tacitus and Dante have the same penetrating truth of observation as to man and the external world of man. They have the common gift of flashing a whole train of thought, a vast range of images on the mind by a few brief and pregnant words; the same faculty of giving life to human emotions by natural images, of imparting to natural images as it were, human life and human sympathies; each has the intuitive judgment of saying just enough; the rare talent of compressing a mass of

profound thought into an apothegm; each paints with words, with the fewest possible words, yet the picture lives and speaks. Each has that relentless moral indignation, that awful power of satire which in the historian condemns to an immortality of earthly infamy in the Christian poet aggravates that gloomy immortality of this world by ratifying it in the next."

Higher praise than this there could scarcely be and it comes from a man of whose ability as a critic there is no doubt while his breadth of scholarship and knowledge of humanity makes his opinion of the greatest possible value. He was born some six hundred years after Dante in a country as distant from Italy in temper as he was himself from Dante in time and yet he can scarcely find words strong enough to express his praise of the great Florentine poet. Dean Milman, however, was but one of a very large group of scholarly Englishmen who during the nineteenth century, when the knowledge of Italian literature became a common possession again, proclaimed their supreme admiration for him. The two great English cardinals, Newman and Manning, might of course have been expected to be sympathetic toward Dante, but their almost unbounded praise shows how lofty was their admiration. Cardinal Manning said "No uninspired hand has ever written thoughts so high in words so resplendant as the last stanza of the *Divina Commedia*. . . . It may be said of Dante *post Dantis Paradisum nil restat nisi visio Dei*."

It is easy to accumulate authorities as to Dante's greatness. Frederick Denison Maurice for instance in his *Moral and Metaphysical Philosophy* has a very strong passage with regard to the place of Dante and the influence of his writings on his own and subsequent generations. His opinion is all the more interesting because he feels that Dante represents a more significant starting point for modern times than the Reformation. He said:—

"Wise men of our own day have said that Dante embodies the spirit of the medieval time and is a prophet of the time

which followed. We testify our assent to that remark by accepting his poem coeval as it is with the great judgment of the Papacy under Boniface with the practical termination of the religious wars, and with the rise of a native literature, not only in the South, but in the North as a better epoch from which to commence the new age of European thought than the German reformation of the sixteenth century."

Most people know Dean Church's high opinion of Dante. After all his years of study of the poet no English writer had a better right to an opinion and he has been absolutely unstinted in his praise. After the passage in the article in the *Christian Remembrancer* for January 1850* nothing more remains to be said:

"The Divina Comedia is one of the landmarks of history. More than a magnificent poem, more than the beginning of a language and the opening of a national literature, more than the inspirer of art and the glory of a great people, it is one of those rare and solemn monuments of the mind's power which measure and test what it can reach to, which rise up ineffaceably and forever as time goes on, marking out its advance by grander divisions than its centuries and adopted as epochs by the consent of all who come after. It stands with the Iliad and Shakespeare's plays, with the writings of Aristotle and Plato, with the Novum Organum and the Principia with Justinian's Code, with the Parthenon and St. Peter's. It is the first Christian poem and it opens European literature as the Iliad did that of Greece and Rome. And, like the Iliad, it has never become out of date; it accompanies in undiminished freshness the literature which it began."

It might be thought that in the course of these six hundred years Dante's great poem would have become out of date or at least would be so antiquated that it would have scarcely more than an antiquarian interest for men. Great geniuses of the modern time have found it a supremely living poem. Dean Church said of it "it is the first Christian poem and it opens European literature as the Iliad did that of Greece

* Republished in *Essays and Reviews* by R. W. Church, M. A., 1854.

and Rome. And like the *Iliad* it has never become out of date; it accompanies in undiminished freshness the literature which it began." Charles Elliot Norton did not hesitate to say that the changes which have come over man's mode of thinking since Dante's time have not diminished the prestige of the great medieval poet which manifestly now is destined to endure for all time. He said:

"The increase of knowledge, the loss of belief in doctrines that were fundamental in Dante's creed, the changes in the order of society, the new thoughts of the world have not lessened the moral import of the poem any more than they have lessened its spiritual significance."

Gladstone, whose deep study of Homer for many years so admirably fitted him to be a judge of what was greatest in poetry, might possibly have been thought, for many reasons, to find Dante unsympathetic. The supreme Greek poet differs so completely from his medieval colleague that it might be deemed hard for a modern to be deeply in love with both and yet Gladstone did not hesitate to say "In the school of Dante I have learned a great part of that mental provision (however insignificant it be) which has served me to make the journey of life up to the term of nearly seventy-three years." Macaulay is perhaps the other great writer in English in the nineteenth century who might well be expected not to appreciate Dante very thoroughly, and yet in spite of his very strong English sympathies at a time when the recent cult of Dante had by no means reached the height it has attained during the past generation, Macaulay compared Milton and Dante and made the greatest of English epic poets fall far short of the stature of his Italian colleague.

On the other hand John Ruskin might have been expected to be thoroughly sympathetic with Dante and yet few would dare to anticipate such lofty words of praise as actually came from Ruskin when he declared "I think that the central man of all the world as representing in perfect balance the imaginative, moral and intellectual faculties all at their highest, is Dante." William Blake, whose spirit was so near akin to the

mystical side of Dante, studied the great Italian poet for a series of illustrations at the very beginning of the modern revival and declared that Dante was inspired by the Holy Ghost. Samuel Taylor Coleridge was another harbinger of the revival and declared Dante to be "the living link between religion and philosophy" and added "You can not read Dante without feeling a gush of manliness of thought."

It mattered not what was the training or the pre-eminent sympathies of men if they devoted themselves to any serious study of Dante, they came almost without exception to be devout disciples or supreme admirers. Carlyle whose Teutonic leanings and studies might possibly have been expected to dim appreciation of Dante, wrote passage after passage in his lecture on the poet as hero which reveal his intense admiration. "For rigor, earnestness and depth he is not to be paralleled in the modern world; to seek his parallel we must go into the Hebrew bible and live with the antique prophets there."

After all these tributes from England it is not surprising to find that American poets and critics were scarcely less enthusiastic in their praise, though they might possibly have been expected, because of distance in time and space, to have missed something of the significance of the great medieval poet. The famous Dante Club was organized at Cambridge to help Longfellow in the translation which he was making and which it was hoped would make Dante a great living force for the American people. Our greatest literary geniuses in America were willing to give their time and mental effort to the exposition of the meaning of the great medieval poet, feeling that they themselves would be amply rewarded by the intimate contact with him. James Russell Lowell, Oliver Wendell Holmes, Emerson, Charles Eliot Norton and other American leaders of thought thus devoted themselves to a beloved task. They felt very probably that, as Longfellow has hinted in one of the great sonnets to Dante which form the prelude to his translation of the Divine Comedy, there was no better refuge from "the tumult of the time disconsolate," for the Civil War was seriously disturbing the minds

of American lovers of their country, than this great poem, so like a magnificent Cathedral in which "kneeling in prayer, and not ashamed to pray," one might rest in peace to have the burden of the heart rending period

To inarticulate murmurs die away
While the eternal ages watch and wait."

After Dean Church's essay probably the greatest critical appreciation of Dante ever written is that of James Russell Lowell who does not hesitate to say of him that Dante represents in his great poem the ancient and the modern world. He is himself the transition between these two great periods, seemingly so distant from each other. "Aesthetically also as well as morally Dante stands between the old and the new and reconciles them." But there is much more than this, "he combines the deeper and more abstract religious sentiment of the Teutonic race with the scientific and absolute systematism of the Romanic." So far from thinking the poet, however, a blend or composite of all these influences, Lowell insists that Dante stands alone, seems to have drawn his inspiration wholly from his own internal resources and dares to lay his scene in the human soul and his fifth act in the other world.

I have taken the quotations from English and American authorities because their appreciation must mean so much. Similar quotations might have been made from the poets, critics and writers on literature of other countries. It has been said of Italy that whenever it neglected or failed properly to appreciate Dante its standards of art and literature were at their lowest and there was an ebb tide of production in aesthetics. Indeed this parallelism between Dante and the Italian national spirit has been formulated into what is known as Cornelius' Law and there has been very definite demonstration of its truth. The law applies to the whole of Europe as well as to Italy and whenever there is neglect of Dante the period has usually been unproductive of really great work.

It is evident then that if Italy had done nothing else except contribute Dante to modern literature, as a country it would eminently deserve a place among those to whom modern civilization is deeply indebted. As a matter of fact, however, Dante was only one of a series of great writers whose works have deeply influenced not only their own beloved Italy, but practically all the other countries of Europe. I think there can be no doubt at all in the mind of anyone who has given a modicum of attention to Italian literature, that there is no European country to whom so much is owed both for pioneer work in literary movements and for the heights to which her writers have attained in expressing the significance of human life in words worthy of the subject.

After Dante but always associated with him in memory, come Petrarch and Boccaccio. Petrarch's sonnets gave that mode of poetry a vogue which lasted many centuries. It is easy in the light of other days to say flippant things of these sonnets of a young poet to another's wife, the mother of many children, but the reality of Petrarch's reverential love is quite undoubted. The young poet looked up to her as one eminently worthy of his respectful adoration and her influence was for all that was good in his life. Some of his sonnets show that he was ennobled by this love and it is easier to understand some of the phases of chivalry and the lack of mere corporeal passion through Petrarch's sonnets than in any other way. It was the very sincerity of them that gave them their vogue and invited so many imitations. While one of the great scholars of the time, Petrarch was a real poet and his influence lasted for centuries and is not yet entirely extinct among the Italians themselves. It was his influence out of Italy, however, that makes Petrarch deserve a special place here.

Unless attention is explicitly directed to it very few people realize how much of Italian influence there is in the English literature of the nineteenth century. As a matter of fact some of the most powerful factors in the writing of the

Victorian period were Italian in origin. Ruskin whose writings meant so much for mid-nineteenth century English, was deeply influenced by Italian motives. His *Stones of Venice* shows this very clearly and the volumes transferred to other people of his generation something at least of the deep impression produced on Ruskin by Italian culture. Walter Pater particularly was touched by Ruskin, but the Italian Renaissance meant more for his developmental years than all his other studies. Pater is indeed in many ways a man of the Italian Renaissance, set down in England at the end of the nineteenth century. The name given the Pre-Raphaelites indicates very clearly how closely this group of young men who did so much to reawaken strivings after culture in England in the nineteenth century felt that they were under the influence of Italians. The Rossettis, father and children were Italian in origin. Indeed it was this that gave them their eminent individuality among the English of their generation. Edmund Gosse in his *Critical Kit Kats* declared that "Gabriel Rossetti both as poet and painter remained very Italian to the last." His sister Christina Rossetti, Gosse declares, wrote religious poems that have no rivals in recent English poetry except those from Cardinal Newman.

Boccaccio acquired influence scarcely less wide than that of Petrarch on literary folk and enjoyed a far wider popular vogue. His revival of the *novella* created a fashion in Europe that was to be rich in productiveness in every country, and was to last for centuries. His stories have been published in many editions in every country in Europe. He is undoubtedly an important landmark in world literature. It is surprising to find how many anticipations of what is apparently most modern in the short story are to be found in Boccaccio. His *Fiammetta* has the distinction in the eyes of many historians of literature of anticipating the merits and defects of Goethe's Werther. It has real pathos and truth to nature and though it seems tedious to us now, accustomed to the rapid sketching of incident and character, it was a great advance over anything that had preceded it. Above all as Dante had vindicated

the vernacular Italian as worthy and capable of expressing the highest poetry, Boccaccio vindicated vernacular prose as a medium for the expression of human emotions, heretofore supposed to be expressible only in verse. He was many defects from the moral side and yet with our modern newspapers and their realistic stories of crimes and the modern novel only too often engaged merely with sex problems, Boccaccio's morality surely can not be much depreected by our generation.

The Renaissance in Italy is usually associated in the minds of men ever so much more with art than with literature and yet there are distinguished contributions to literature made by the Italians at this period. Her art was so great that Italy might well have dispensed with great inspiration in letters, but had that happened the world would have missed some very precious treasures. The Italian writers of the Renaissance, influenced not only the Italy of their time but also the world and their influence still continues to be felt. The three great Renaissance writers in Italy were the poets Ariosto and Tasso and the prose writer Machiavelli. All three were widely read beyond the bounds of the lands where Italian is spoken. Ariosto's influence has waned in other countries, but still remains of great significance among his own countrymen. His Italian style makes him one of the peninsula's great writers and his continued popularity among his countrymen is of itself quite enough to demonstrate Ariosto's qualities as a genuine poet.

Tasso wrote one of the greatest of epics that is at the same time so intensely human that for several centuries it was probably the most widely read book among educated people generally throughout Europe. He deeply influenced the poets of many other countries and while no longer read in anything like the way that it used to be, it still continues to be published in editions at regular intervals in most of the European languages and remains one of the books that no educated man cares to confess entire ignorance of. Chivalry received its highest poetic expression from Tasso centuries after the in-



PALMA VECCHIO, POET (SOMETIMES CALLED ARIOSTO)

stitution itself had ceased to exist and when a great poetic imagination was needed to revive interest in it. Jerusalem Delivered now more than three centuries after the death of its author must be considered to occupy a permanent place in world literature.

Machiavelli is more difficult to place in the estimation especially of the western peoples of Europe, but undoubtedly his prose works are among the greatest contributions in this mode to the literature of western civilization. It has often been said that there are four writers of history whom no one who plans to write history in our day can afford to neglect. These four represent the climax of the power of man's mind to see through human motives and express the meaning of human activities in terms of the spirit that rules men. They are Thucydides, Herodotus, Tacitus and Machiavelli. The three first named are beyond all doubt the greatest writers of history in the world. There is very general agreement that Machiavelli is the only writer of history in modern times who deserves a place beside these because of his penetrating knowledge of human nature. His history of Florence has been proclaimed one of the master pieces of the literature of the knowledge of the human heart. The Prince (*Il Principe*) is an essay in political philosophy that no one interested in human events, either a statesman or historical writer can afford to miss. It has become the custom to bewail the lack of morality displayed in the principles which Machiavelli lays down for rulers' direction, but if we had any illusions as to how much better our generation was in this regard than Machiavelli's or how far we had advanced from the crude standpoint of the Renaissance, most of them have been dispelled by the great war. Machiavelli's insistence on the need of a popular army has received a striking confirmation from the experiences of our day. His deep knowledge of human nature made him the favorite reading of so great a mind as that of Francis Bacon who quite candidly confessed his obligations to him.

Three writers of the Renaissance time Vasari, Benvenuto,

WHAT CIVILIZATION OWES TO ITALY

Cellini and Baldassare Castiglione, have been the favorite reading of men particularly, not only in Italy, but in most of the countries of Europe during many generations since that time. There is scarcely anything to be compared with them in other literatures. Vasari's biographies of artists have deservedly won for him the title of "the Herodotus of art." Cellini's autobiography is one of the most wonderful confessions ever made. Only St. Augustine and Rousseau may be mentioned with it perhaps, and Cellini stands alone in many regards. Castiglione has written a book that while expressing better than almost anything that we have from that time the innermost feelings of the men and women of the period, has enough of elegance, acumen and graceful but not cumbrous erudition to make it a favorite book of reading among the better educated classes, whenever and wherever there is a serious literary taste to be found. It deeply influenced England where it contributed to form the character of Sir Philip Sidney and it was destined to attract attention in many subsequent generations and is thoroughly alive in our time.

After the Renaissance Italy continued to exert an immense influence on the literature of the world, but unfortunately not always for what was in best taste. A sad blight fell upon Italian literature during the seventeenth century which has been variously explained. Garnett's expression as to it is interesting for he says that it was due to "the malady which necessarily befalls every form of literature and art when the bounds of perfection have been reached, the craving to improve upon what is incapable of improvement" which leads men to add decorations to buildings and what are called beauties of style to literature until the bounds of good taste are overpassed. As a result of this tendency there came at this time a striving after mere verbal beauty which led away from true literature. The greatest offender was Marini. His poetry unfortunately attracted attention all over Europe. A series of artificial literary efforts of many kinds developed in the seventeenth century. Garnett suggests that in some respects

Marini might be compared to the Cowleys and Crashaws of the time of Charles I, "but he is physical while they are metaphysical: his conceits are less far fetched and ingenious than theirs and few of them either could or would have produced his licentious, but from an artistic point of view, admirable Pastorella." The interesting feature of Marini's career for us is his wide influence. Italy was, as so often, the leader, but alas! in a wrong direction.

Other Italian poets of this seventeenth century did work that was equal to any poetry written among the Latin countries of Europe, except in Spain during the first half of the century and they still occupy an important place in Italian literature. Francesco Redi to whom we devote much more attention in the chapter on the biological sciences was "a distinguished poet as well as an illustrious physician and naturalist." (Garnett.) His well known poem, *Bacchus in Tuscany*, has been beautifully translated by Leigh Hunt and Garnett thinks there can be no doubt that Dryden had it in mind when he wrote *Alexander's Feast*. Edmund Gosse translated some of his sonnets and Redi has not been without critical admirers in practically every country in Europe. Two of Redi's friends Menzini and Filicaja are poets of no mean order and Filicaja's sonnet to Italy is one of the great sonnets of the world to be compared only with some of Milton's or Wordsworth's or some of those written by Dante or Shakespeare.

During the eighteenth century the era of poor taste in poetry continued and after the foundation of the Arcadian Academy which fostered another epoch of pastoral poetry with a deluge of insipid verse that had the one good effect, it prepared the way for Romantic revolt at the end of the century and the beginning of the next. Unfortunately for Italy its one epoch of dramatic literature came during this period and so Italy has nothing to show in any way equal to the dramas of France or Spain or England and has comparatively little place in the history of dramatic literature. Three of the men, however, who contributed to the Italian dramatic

WHAT CIVILIZATION OWES TO ITALY

literature, such as we have it, were certainly leaders in the second rank of great dramatic poets and their influence was widely felt. Metastasio, Goldoni and Alfieri are names to conjure with even yet. Metastasio's librettos for operas are probably the best ever written. It has been said of him that "He is a very Scribe for briskness, deftness and clever contrivance of plot." Goldoni, the Italian writer of comedies does not approach in any way the exhibition of the *vis comica* of Moliere, who was the object of his idolatry, but anyone who has seen Signora Duse in *La Locandiera* can not help but feel that its author had marvelous power in the comedy of manners. Alfieri is far below either Corneille or Racine, and yet he has merits that rightly gave him a European reputation and at least continental influence at a time when the drama everywhere had declined and when he must be considered to have been the protagonist of what was best in serious dramatic literature.

During the nineteenth century Italy continued to contribute in at least as great degree as the other countries in Europe to the literature of the time. With the coming of what is sometimes called the romantic period or the return to nature in which the spirit of the French Revolution played so large a part, Italian writers took their places besides those of other countries. Ugo Foscolo was probably as widely read throughout Europe among educated people at least as anyone of his time. His romantic career and agitated life, due partly to his own lack of self control, yet vindicated by the rejection of the bribes of Napoleon and the favors of the Austrian Government though these sent him into exile, brought publicity for his work. The *Return to Nature*, which he had only begun, was completed by Manzoni, whose *I Promessi Sposi* came to be one of the most read books of the time. He well deserves to be named beside Goethe and Byron and Sir Walter Scott and his novel went through many editions in every important European language and still continues to be read by all those who have any pretense to a knowledge of literature outside of their own countries.

LITERATURE

European reputation scarcely less wide and an influence even more deep, though in an ethical rather than a literary sense, was acquired by Silvio Pellico's *Le Mie Prigioni*. The author told the story of his ten years' imprisonment in such simple, yet natural terms in such a realistic yet self-pity-shunning manner that he won the hearts of all readers. After a hundred years it still continues to be read in most languages and very few who have read it once fail to go back and read it again and again. In its own time it was one of the most famous books of the early nineteenth century and it proved to have a great moral force for his native Italy in her darkest day when Austrian domination was so cruel. His long imprisonment broke his spirit and probably crippled his genius, though his tragedy of Francesca da Rimini was very much admired and still continues to be read by those who want an Italian version from a real poet of the sad tale of that young Francesca, whose story at the beginning of the *Divina Commedia* has so well been called "the lily in the lion's mouth."

Italy's greatest poet of the nineteenth century, Leopardi, is also one of Europe's greatest poets of the period. Few men have ever presented a more perfect wedding of sense and form than Leopardi and it has well been said that the transcendent excellence of his scanty literary performances raised Italian literature to a height which it had not attained since Tasso. Two other Italian poets of the nineteenth century have come to be world characters known beyond the bounds of Italy. One of these is Carducci, the national poet of united Italy, whose lyrical genius has been declared to have "poured new blood into the veins of Italian poetry." Carducci has abounding vigor combined with a devotion to form that makes him a model for modern poets. Besides achieving distinction as a poet Carducci was a distinguished critic, especially capable in his judgment of foreign literature. While an intense patriot he had a thorough going appreciation of the literary work of other nations. His greatest rival and his successor as the representative poet of Italy is D'Annunzio, better known as a novelist than a poet, but undoubtedly one of the greatest

WHAT CIVILIZATION OWES TO ITALY

poets alive in our day, unfortunately poor as it is in poetry. In our time comparatively few writers are known to any extent beyond the bounds of their own countries for their literary work and during the nineteenth and twentieth centuries Italy has had more of these than probably any other country. D'Annunzio's novels are almost the only novels of our time which are very generally read in other languages besides that in which they are written. Italy has another novelist in our day, almost as well known as D'Annunzio, Verga to whom the story that forms the libretto to *Cavalleria Rusticana*, popular in the European countries at least, is due.

At all times then Italy has had literary men of distinction always exerting a deep influence on other countries and much more often well known beyond the bounds of their own country than probably the writers of any other nationality. When it is recalled that literature is the one mode of artistic excellence in which Italy does not surpass the other nations, at least it is clear that even in this the peninsula has not fallen behind and that the power to foster genius is just as manifest in this department of human expression as in all of the others.

EDUCATION

ORDINARILY it is assumed that Italy's most important contribution to world culture is in the arts, but surprising as it may be to many people unaccustomed to think of the Italians as pioneer educators in nearly every department in modern times, it is probable that the world's greatest debt is owed to them for what they have done for education and scholarship. Indeed so much has been done that separate chapters have to be devoted to these two subjects in spite of their very intimate relations. In practically every period of modern development until the beginning of the nineteenth century when, after the Napoleonic wars, for political reasons rather readily understood, there was a lapse, Italy has been the leader of the world in education. In every phase of the intellectual life of humanity Italy has not only developed education for her own people to a high degree, but has impressed her academic thought deeply upon other nations. This is true not only for modern history since the Renaissance but ever since the decline of Greece, and is true not only as regards arts and letters, but also the sciences, pure and applied, and the ethical as well as the physical sciences, besides for medicine and surgery.

The Romans took up Greek education which had been rather suggestive than systematic, and gave it a definite organization. They laid down the principles on which our modern education was to a very great extent to be developed. Cicero and Quintillian made important contributions to the theory of education and gave valuable hints as to its practice in what may be called the cultural departments of human knowledge at least. During the earlier Middle Ages Italy

WHAT CIVILIZATION OWES TO ITALY

succeeded not only in keeping alive the flickering flame of culture and passing it on from generation to generation, but as we shall see, began that organization of education which was to mean so much for all the subsequent centuries to the modern world. Only a superficial knowledge of the history of what has been so well called the humanities is needed to enable us to appreciate the truth of this.

In the Middle Ages Italians were the great leaders in a magnificent period of artistic, intellectual, literary and educational accomplishment. In the Renaissance Italy taught all the nations of Europe. In modern science though this is sometimes thought of as a field of human effort not cultivated to any considerable extent by Italy, an Italian stands as the founder in nearly every important scientific department, while some of the most important of those born out of Italy who have laid deep foundations in sciences were educated down in the peninsula, or owed a preponderating part of their intellectual development to her schools or her writers.

The first great series of educational institutions in modern Italy that is after the breaking up of the Roman empire, were the Benedictine monasteries. There was a time not so long ago when in English speaking countries the impression was very prevalent, that monks were rather impractical individuals lacking in any right sense of initiative who had retired from the world because they were unwilling to face its trials and difficulties and labors and who were eking out at worst a lazy and at best a lackadaisical life, in the easy going secluded existence of the cloister. Our generation has changed all this false impression as the result of even a little real knowledge of monasticism. When the barbarians had overrun the Roman empire and destroyed its institutions of learning and culture, and themselves without interest in the things of the spirit were preventing others from occupying themselves with the intellectual life in the cities and towns, monasticism came to provide a series of quiet retreats where men might cultivate the spiritual and

EDUCATION

the intellectual life in peace. There was sufficient required occupation of body to ensure good health and the training of hand and eye that developed men roundly and secured the evolution of the arts and crafts.

St. Benedict founded his monastery, wrote his rules for his monks, and at a time when that was sadly needed restored the dignity of labor, for everyone who entered the monastery, prince or peasant, had to work with his hands; yet at the same time he provided men with a magnificent opportunity to develop every intellectual interest. His monasteries became great centres of civilization and of education but also of social work and opportunities to rise. The peasants who were attached to the monasteries learned to know how happy life might be "under the crozier" and their sons and daughters became the foster children of the Benedictines. Benedict's foundations gradually spread throughout Italy and proved to be oases in the desert of the barbarous life of the time, where the traveler through life, wary with trouble over many things, might find peace and the opportunity for his own development. It was in these institutions that satisfaction with life was appreciated as coming from within and not from without, from a man's own faculties and not from external pleasures. When life in the cities had become a dreary round of self seeking pursuit of the trivial, no wonder that monasticism spread rapidly all over the world.

If Italy had done nothing else but give the world this great institution of monasticism, establishing it, organizing it, developing it according to the needs of men of various places and times, and demonstrating its ability to be a great help to mankind, the debt of civilization to her would be very great. Every mode of the intellectual life was fostered by the Benedictine monasteries and by other monastic institutions which arose in imitation of them and many of which had their origin in Italy. Nor must it be thought that the monastic foundations benefitted only the men for as we shall see in the chapter on The Women of Italy, what Benedict did for the men his sister Scholastics did for the

women, and with quite as great success. The Benedictine nunneries in Italy became the homes of feminine culture and education and then were spread throughout all of Europe. Women members of the nobility who did not want to marry, or whose inclinations were toward intellectual or spiritual life and who found the ordinary home life too distracting for their peace of mind, could secure refuges for the quiet of contemplation and meditation and study in the nunneries. Even in such so called "dark ages" as the tenth and eleventh and twelfth centuries, we have writings of these Benedictine nuns preserved for us, dramas, political and medical essays, chronicles, fiction, legends, which show us how intense was the intellectual life among the women of the time and how much they were doing for themselves. The real significance of all this feminine intellectual life that came about through Italian influence was missed until recent years, but now there is so much that deserves to be said about it that it has to be reserved for the special chapter on Feminine Education.

Taken all in all these monastic institutions for men and women founded in Italy and developing to their highest extent down there, for a thousand years, until the very beginnings of modern life, were the greatest factor for education and through that for civilization and culture as well as for the diffusion of happiness among mankind. Monasticism was not without its abuses. No human institution ever is. These abuses, however, were comparatively rare and the institution carried with it its own compensatory factors by which reformation could be brought about from within and reforms actually were instituted over and over again, when a great saint came to renew the spirit of the religious life or the Church authorities recognized the need of it. When the confiscation of the monasteries came the excuses put forward for the spoliation were never the real motives. It was not because the monks were idle and lazy, nor because corruption had spread among them, but because in the course of generations the value of the unremunerated

EDUCATION

labor of so many men, together with the gifts of those who appreciated the great social work they were doing, accumulated to such an extent as to prove a temptation for selfish rulers and politicians intent on securing riches for themselves.

It was the presence of this large body of men most of them well educated, but all trained to work out whatever they considered their duty without question of personal remuneration, that enabled the Church to begin in Italy that organization of education extending to all classes which the modern researches into the history of education have so surprisingly revealed. The first elementary schools were those of the monasteries. Later there came town and village schools all of ecclesiastical origin under the direction of the Church and usually taught by members of the religious orders. As early as 774 there was a school law enacted in Italy that each Bishop should found an ecclesiastical school and appoint a competent teacher to instruct "according to the tradition of the Romans." Pope Eugene II ordained in 826 that efficient teachers should be provided for the Cathedral Schools wherever needed, who were to lecture "on the sciences and the liberal arts with zeal." The Council held in Rome in 1079 under Pope Gregory VII passed a decree that "all bishops shall have the liberal arts taught at their churches." The Lateran synod, a century later (1179) enacted "in as much as it behooves the Church like a loving mother to see to it that poor children who can not count upon the support of their parents should not lack opportunity of learning to read and make progress, there should at every Cathedral Church be given an adequate wage to the teacher who is to teach the clerics of the Church and the poor pupils gratuitously."

This organization of popular education in the Middle Ages in Italy is often ignored or fails to be appreciated. The extent to which education was developed even long before the end of the Middle Ages would perhaps be best appreciated from Villani's computation that fully 12,000

children out of a population of 90,000 which Florence contained in Dante's time, attended school. The large majority received only an elementary training and the apprentice system supplemented school life. How much of real education the apprenticeship involved and how truly it represented a thoroughly practical continuation school at this time will be readily understood from the magnificent achievements which made Florence's artisans so famous. Brunelleschi and Donatello were only goldsmith's apprentices and many others of the great painters and sculptors of the Renaissance received their technical training and their artistic initiative from the environment of one of these Italian workshops. Our generation is engaged in trying to learn how it may secure some of this same genuine education of eye and hand as well as of mind for its children.

Toward the end of the Middle Ages some of the Benedictine monasteries began to assume forms which remind us of modern educational institutions. The famous Monastery at Monte Cassino which for so many centuries was the centre of learning and intellectual incentive is a typical instance. Here not only the Benedictines themselves, but many of the sons of the nobility of Italy obtained the opportunity for education while the monastery itself by the copying of books, by communication with other monasteries of the East and the West and by the intercourse of scholarly members of the order became a great clearing house of the intellectual life of the time.

✓ Not far away at Salerno under Benedictine influence there came into existence the first modern university. This obtained greater reputation for its medical department than for any other. To this first modern medical school flocked students from all over the world and professors from every nation. According to the tradition which is probably not literally true, but which is veritably symbolic of early conditions, the first professors were a great physician from North Africa and another from Asia Minor, associated with no less distinguished colleagues one a Jew, the other an

Arab. This story typifies the world influence which is recognized to have made itself felt in Salerno from the very beginning.

The medical school at Salerno is the first university department of modern times. It reached its climax of efficiency during the twelfth century. From this period we have a series of textbooks of the teachers and the translations and compilations which were made for the use of students, and we know not a little of the many patients who came to be treated there and of the professors who went out from the South Italian centre of learning to teach at other universities. The best known of their teachers is ✓ Constantine Africanus, born in Africa a traveling scholar in the Orient during his earlier life, but whose productive later years to a fine old age, were all spent under the fostering care of Italy. Nor was his a solitary work, for we have the books of many other Salernitan teachers. Perhaps the most interesting feature of the education at Salerno was that the department of women's diseases was placed entirely in the charge of women and licenses to practise medicine were issued to them freely and in large numbers not only for the neighborhood of Salerno itself but for Naples and all of Southern Italy at this time. Of this subject more is said in the chapter on Great Italian Women.

Salerno has a definite place in the evolution of medicine because it represents a reaction against the older Arabic medicine with many of its far fetched theories and its tendency to sophistication of treatment. Above all the Salernitan School insisted on getting back to the simple natural remedial measures, air, exercise, diet and the use of water while avoiding the polypharmacy of the Arabs. The popular medical book of that time, the famous *Regimen Sanitatis Salernitanæ*, is one of the best in the sense of most sensible, popular books on medicine ever issued. It went through some three hundred editions not a few of them in the nineteenth century and is still often quoted. This kind of

contribution to popular education is just the sort of thing that is not ordinarily expected from medieval Italy.

How much the Benedictine monks who were prominent in their influence in the school had to do with all this intellectual development we are not sure, but there are some very good reasons for thinking that they were more largely responsible for it than any other agents. The best known of the teachers of medicine at Salerno Constantine Africanus became a monk in the monastery of Monte Cassino and wrote his great books for which he is famous in that peaceful refuge. His dearest friend had been the Abbot Desiderius, the head of the monastery and doubtless Constantine had retired to Monte Cassino with the idea that they two as congenial friends would spend the rest of their lives there together, but only a few years after he entered the monastery Abbot Desiderius much against his will was made Pope under the name of Victor III and while he encouraged Constantine in every way in his work the two friends were separated for the rest of their lives.

Salerno thus became the centre of the educational world of that time and the eyes of scholars all over were turned there. Duke Robert of Normandy and many members of the Anglo-Norman nobility went down to Salerno to be treated and there are traditions of noble and royal visitors from Germany and France and it is easy to understand how the reputation of the school would spread under such circumstances. The Italian tradition thus established flourished down to modern times. Men came to think that when they could not obtain facilities for higher education in their own country Italy was the place to seek them. This reputation continued practically until the beginning of the nineteenth century. During the last half century Germany has been the home of post-graduate teaching to which the scholars of many countries turned when they had exhausted the educational opportunities of their native country. Before that for half a century France was the *mecca* of graduates seeking further knowledge. During all the seven centuries before

EDUCATION

the nineteenth however Italy was almost the exclusive home of the world's greatest post-graduate teaching in every department, in medicine, in law, in the biological sciences generally, in surgery, in mathematics, in astronomy, in philosophy and theology, in all that related to ecclesiastical matters, as it has been since the Renaissance time in the classics and all that that term includes.

✓ After the University of Salerno came Bologna the nucleus of which was a law school under Irnerius the great medieval authority on Roman Law. This law school came into prominence at the end of the twelfth century. Before the end of the first quarter of the thirteenth century there was a school of philosophy, of medicine, and of theology to complete the university. At the end of the thirteenth century Bologna had become as famous for medicine as for law at the beginning. The University has continued for seven centuries to be one of the most important educational institutions in the world. There have been many periods when Bologna was the most important University not only of Italy, but of the civilized world. There have been others when the institution has fallen below the highest standards, yet never at any time has the educational work of Bologna been trivial. Never for instance did it fall as low in its provision of educational opportunities as Oxford during the eighteenth century, or of some of the German Universities after the religious disturbances which followed the Reformation. Bologna, Paris, Oxford have been the three great names in university history and while Bologna is probably more famous than either of the others for positive achievements, she has less of negative moments in her history to her discredit.

After Bologna came a whole series of university foundations in Italy, some of them made very soon after that of Bologna and all of them representing the finest kind of aspirations after the higher education. Padua is the most important of these and for over six centuries has been a thoroughly cosmopolitan rather than a municipal or even

national university, with a world appeal to students. In medicine Padua was during many centuries the leader of the world. Many a foreign student has come to Padua to secure opportunities for anatomical, physiological, medical, surgical, clinical work that could not be obtained at home, and he has gone back to spread the light of Padua's knowledge and methods of teaching. Some of the greatest discoverers in all branches of medicine are on the rolls of Padua either as students or professors. Vesalius, Linacre, Harvey, Steno, these alone would be enough to glorify any university, but they are but a quartet of the greatest and Padua has many hundreds of foreign students whose names are immortal in the history of medicine. Padua came under the authority of Venice and the Venetian Republic was liberal in its provision for education and still more liberal in its assurance of freedom of teaching at the university and its encouragement of original work and investigations of all kinds. Any country in Europe might well deem itself rich in educational influence in history if it had but Padua's record. It must not be forgotten that Padua is but one of a score of universities in Italy and while it is one of the greatest, with Bologna indeed as its only serious rival in prestige, all the other Italian universities did good work and some of them, as the University of Naples or the Sapienza at Rome or the University of Pavia are second in rank only to their greatest Italian rivals.

Lest perhaps it should be thought that Padua's influence was only in the Middle Ages or perhaps did not reach beyond the Renaissance it might be well to note that the prestige of the University of Padua in the seventeenth century and its power of attracting foreign students, which could only have persisted because of its maintenance of high standards and provision of the best facilities for education, is evident from the fact that in the Archives of the University we find, during this century, such familiar names as Ramsey, Bannerman, Dixon, Short, Callahan, Roper, Leith, Anderson, Roberston, Campbell, as well as many others that

seem strange enough at an Italian University in the century after the Reformation. They indicate that men from all three of the countries of Great Britain and Ireland were willing to make what was then the very long journey to Padua, far more arduous than the trip to Europe for American students even from the distant West, in order to secure the opportunities for the higher education presented by that university and enjoy the incentive of the contact with great teachers which the greatest university of that time provided.

✓ Italy was the cradle of the universities as we knew them then, she made the mould in which the human mind has been cast ever since. In doing so the Italians created practically all the distinguishing traits of academic institutions as they have developed in modern times. The four distinctive features of university life or indeed of the life of any institution of learning are (1) the organization of a curriculum, (2) the institution of examinations, (3) the conferring of degrees, and (4) the co-ordination of teachers and students of different departments. All these are of Italian origin. They are the heritage of the modern world from medieval Italy due directly to the marvelous genius for the practical organization of human life in all its interests, but especially the intellectual life which Italy possessed. The curriculum of studies, the seven liberal arts of the *trivium* and *quadrivium* held sway in higher education for over 1,000 years. It was unknown in antiquity. It has often been misunderstood and even referred to contemptuously in the modern time, but not by those who really knew it and its workings in detail. Even Huxley is on record with the declaration that the curriculum of no modern university was so well calculated to develop the many sided mind of men as this medieval *trivium* and *quadrivium*. Examinations, the second of these Italian inventions in education seem very obvious now, but they represented a great invention and discovery in their own time. Degrees are now so commonplace as to be very much abused, but the conferring of the degree as a formal

reception of the student into full membership of the academic guild was quite literally "a patent of academic nobility" which brought distinction, privileges and immunities as well as special titles. It introduced the individual at once to his academic dignity and was a notable advance in university organization. The organization of the faculty as such with the interdependence and coordination of teaching which this implied and the development of cooperation for disciplinary purposes which it naturally involved, is another of these wonderful contributions of the Italian talent for organization. The world owes a very large debt for it, though until comparatively recent years this indebtedness has been almost entirely lost sight of and even now is properly appreciated only by the comparatively few who have taken the time to study the history of universities with reasonable fullness.

Practically every important detail of our modern University system had its origin in the medieval universities and most of these origins can be traced very definitely to Italy. It is surprising down to what minutiae of curriculum and discipline and social life this old-time influence can be followed. President Stanley Hall in his address on "Medieval and Modern Universities" delivered at the celebration of the 25th anniversary of the Catholic University of America, May 1915 points out that the fraternities and other student societies of to-day here in America as well as the *Landsmannschaften* and student corps of the German universities originated in the so-called "nations" of the old universities whose organization at Bologna meant so much for university life and was imitated elsewhere. He also points out that our honor system, academic vesture, the docent system, initiation ceremonies, hazing, indeed all the phases of student life in the modern time—except competitive athletics—are to be traced to medieval university customs. The wearing of academic vesture is becoming more and more of a sacred custom, the debating clubs of the universities of our day and even the organization of debates for various extramural societies as by the Universities of Wis-

consin, are a repetition of the disputations so dear to the heart of the medieval Italians particularly. So that Italian medievalism is on the ascendant rather than on the wane in our universities until as Dr. Hall suggests "if we compare all this with Sheldon's compilation of student customs in this day and land we shall be struck with the ultra conservatism and the utter lack of originality on the part of modern students in this field."

Dr. Hall does not hesitate to say even that "while appropriations and endowments have vastly increased and brought with them centralization of control, student life has, until the recent athletic movement, added almost nothing not found in the early days of reaction from the strictness of cloistral rule, if indeed it has not lost much of its pristine freshness and romance. As to the relation of studies to life and to the social, political and religious institutions of their time, no university of our own day has been more practical than its medieval forerunners. The ideals of academic youth are often said to be the best material for prophecy or the the best embodiment of the *Zeitgeist*, and we are often told that as Oxford inclines so England will go a generation later; and so as these medieval universities led, Europe followed. There is always a sense in which a university does not consist of buildings, endowments or numbers of students, but is a state of mind. It is found whenever a great teacher and a few gifted pupils are gathered together. In all these respects the more we know of the medieval universities the more we shall see that we owe them."

Not only the universities themselves are of interest, however, in the history of education, but many of the incidents of their work show how much was due to Italy for the great intellectual development of the Middle Ages which now instead of "dark ages" we are coming to call the "bright ages." With the beginning of formal university life as we now know it, during the first half of the thirteenth century, there came the foundation of the mendicant friars which was to mean so much for the education of all classes

during the subsequent centuries. Their work was felt above all in Italy where indeed St. Francis made his foundation and where some of the greatest of the work of St. Dominic developed. These orders realized very soon the place that universities were coming to have in the life of the people of the time and they proceeded to take advantage of it. As a consequence some of the most distinguished of the teachers of the universities belonged to these orders. Albertus Magnus, St. Thomas Aquinas, St. Bonaventure, Duns Scotus, Roger Bacon are typical names taken almost at random of the distinguished teachers and writers who were members of the mendicant friars. What these new orders did above all was to provide an opportunity for the sons of even the very poor to obtain even the highest education if they had the desire and the talent for it. Members of all classes entered these orders and were educated according to the ability they possessed. This new departure in education which meant so much was almost entirely Italian in origin. Italy continued to be the great home of the mendicant friars for centuries and the centre from which they were governed.

Most of the important auxiliaries of education as we now know them had their origin in Italy. Among these the most valuable are academies so-called and the history of academies has its most significant early development in Italy but we have had to reserve their story for the chapter on Scholarship. For the modern world museums had their origin there, not only in all that regards the arts as everyone knows, but also as few realize in what concerns the sciences. Father Kircher's museum founded over 250 years ago, to which the Jesuits from all over the world sent various objects of interest is still in existence. As a matter of fact most of the Italian Churches and monasteries were from very early Christian times veritable museums, that is housing places of materials associated with the arts to which the ancients attributed the patronage of the muses. In them great works of art often of high distinction, always of significant educational value for the community were on exhibition.



CATHEDRAL, MILAN, ITALY

EDUCATION

The manifest conviction throughout Italy was that great art should not be the exclusive or even limited possession of private individuals, but should be where the public could easily get at it and where indeed it is not only tempted to come to see it but as far as possible inevitably bound to be brought in intimate association with it while engaged in the fulfillment of other duties. Accordingly the Italian spirit was to have the great pictures painted not for private collections but for the churches, monasteries, hospitals and town halls. In these public places they were not only always easily available for educational effect, but indeed fairly thrust on people's attention to the inevitable betterment of taste and provision of high intellectual pleasure.

In science the anatomical theatres and the laboratories of various kinds are of Italian invention and a great many of the technical adjuvants—the dissecting room for so long the only laboratory available for medical students is a typical example—come from Italian initiative. While a group organized for the discussion of a problem in education is now usually spoken of as a Seminar—the German term for a modern German reintroduction into education,—it was in Italy that this custom first originated in the formal disputations organized by the students of scholastic philosophy. The institution was developed finely to the great advantage of the members in medieval Italy. It is indeed a by-product of that interchange of argument on important questions insisted on by the great teachers of scholastic philosophy, because it refines and renders knowledge accurate. Circles *circula* as they were called in medieval Latin, still have their place in the teaching of Catholic philosophy by a direct heritage from the old Italian schools of philosophy.

After the Middle Ages came the Renaissance and still Italy maintained her primacy in education and the intellectual life. The story of Renaissance education in Italy has attracted wide attention in our time. There have never been more kindly charming scholars as teachers, whose pupils thought more of them or who served to arouse more

enthusiasm for education, than those of the Italian Renaissance. The life of Vittorino da Feltre has been written over and over again in every country in Europe in recent years and there have been several lives of him in English during the past generation. The story of this son of poor, though noble, parents who went to Padua as a student where he maintained himself by teaching students younger than himself and by waiting on the solitary professor of mathematics, who however declined to instruct him except for payment in money, is indeed interesting. Having acquired a magnificent education for himself Vittorino insisted when summoned to Mantua by the Gonzagas that poor students should be allowed to attend lectures in the Palace School free and that women should have the same opportunities as men. No educator in history has been so forward looking or so thoroughly comprehensive.

It is often concluded that the insistence in recent years on the necessity for training of body as well as of mind is a new development in education. On the other hand the question of religious education and of the necessity for uplift of soul and of heart which is so much under discussion at the present time is often presumed to be a dawning horizon of educational evolution. The story of Vittorino da Feltre's work shows how clearly he anticipated these supposedly modern ideas in education. He insisted on caring as much for the bodies as for the minds of his pupils and believed it his duty to lift up hearts and cultivate souls as well as train memories and impart information, and the more one knows of the details of his school work, the easier it is to understand why he has been looked up to as probably the greatest school-master of all history.

In his school at Mantua as we have said, poor boys of special promise were gratuitously educated, together with the sons of wealthy parents who could afford to pay the usual fees. Altogether there were some sixty or seventy scholars and no matter what their rank they were under the self same discipline. All played together, and Vittorino's school

must have been a magnificent training in essential humanity and in thorough going sympathy of all the different classes of citizens with each other so far as a school could affect that consummation. Vittorino believed in making schools a pleasant and not at all a gloomy or forbidding place and his schoolhouse received the name of the "Pleasant House," and was situated in the midst of playing fields on the slopes above the Mincio.

No more interesting, broadly human traditions gather round any even of the great English public schools than have come to us with regard to this great Mantuan School of Vittorino. He spent some twenty-two years as a school master. During those memorable years, Woodward, who has made a special study of Vittorino's work, declares that "He established and perfected the first great school of the Renaissance -- a school whose spirit, curriculum, and method justify us in regarding it as a landmark of critical importance in the history of classical education. It was indeed the great typical school of the humanities." Professor Sandys of St. John's College, Cambridge in his *Harvard Lectures on The Revival of Learning* (Cambridge University Press, 1905) to whom we owe many of these details, has told the story of how Vittorino's first care was to modify the physical constitution of the two sons of the Marquis of Mantua and although they called for very distinct and indeed quite opposite treatment Vittorino succeeded by nice discrimination in making them healthy, manly fellows. "Both of them unhappily had been spoiled; the elder was so fat that he could hardly walk; 'he moved as if he had been made in one piece' (Creighton); the younger was attenuated and awkward; but the skill of Vittorino soon brought them to normal proportions."

These are the sort of problems that are usually supposed to have been recognized as clamoring for solution from the school master only in our time. Vittorino, however, led his pupils in their athletic exercises "and his heart rejoiced when their shouts went up to heaven and all was filled with dust." He believed it important to arouse in his boys the spirit of

bravery and to harden them for the standing of pain and discomfort and also to make them indifferent to heat and cold. Perhaps the best tribute to his completeness and balance as a school master is to be found in the fact that though thus much interested in the physical side of his students, he accomplished so much with them from the physical side as to make it rather difficult to understand how he got the time to do it all.

For his course of reading of the classic authors was very broad and extensive. The Latin authors studied in his school included Virgil, and Lucan with parts of Horace, Ovid and Juvenal, besides Cicero and Quintillian, Sallust and Curtius, Caesar and Livy. The Greek authors were Homer, Hesiod, Pindar and the dramatists, with Herodotus, Xenophon and Plato, Isocrates and Demosthenes, Plutarch and Arrian. It is no wonder that he had no time for the writing of books or the editing of special editions of the authors. He graced his influence deeply on the generations to come through his pupils. Federigo, the famous soldier and scholar who founded the Library in the Ducal Palace at Urbino one of the first of modern book collectors was one of these. Another was Leoniceus, his successor whose grammar was widely used. A third was Perotti, the author of the first large Latin grammar and Giovanni Andrea who was the editor of the first printed editions of as many as eight of the Latin classics:—Caesar, Gellius, Livy, Lucan, Virgil, Ovid and The Letters and Speeches of Cicero. In his splendid edition of Livy, Andrea paid a special tribute to his master Vittorino. If Italy had contributed no other great school master than Vittorino the world's debt to her in education would be very great.

Scarcely less important in the history of education is the name of Guarino of Verona an older man by eight years than Vittorino to whom he taught Greek. He lived for some fourteen years after his pupil, attaining as did so many of these busy scholars an advanced age. Guarino was the better scholar though not so influential a teacher. He had a wider knowledge of Greek, a more minute familiarity with details of

textual criticism in Latin, but while Vittorino declared that a learned man without goodness was dangerous and tried to educate his pupils to be good citizens, to serve God in Church and state, Guarino seems to have concentrated much of his attention, as Sandys says, on the narrower aim of producing clever and eloquent representatives of pure as opposed to applied scholarship. Scholars flocked to Guarino from all over Europe, his English pupils included a Bishop of Ely and a Bishop of Bath, a Dean of Wells and a Dean of Lincoln, the Hungarian Bishop Janus Pannonius eulogized him as his master in more than a thousand hexameters and he had any number of distinguished Italian pupils including especially a number of scholarly ladies. Guarino won the hearts of his pupils quite as Vittorino did and his teaching remained a precious influence on character as well as mind for the rest of life. These two Italian schoolmasters have been the living study of serious educators ever since who have felt that here indeed were models for all time.

One of the most important elements of Italy's contribution to education in the later Renaissance time is the organization of the Jesuits at Rome and their constantly existing focus of influence there. St. Ignatius himself was not an Italian but a Spaniard, but traces of Italian influence are to be found in all the work of the Jesuits. Some of the greatest of the generals of the Jesuits and especially those who like Aquaviva and Vitelleschi, whose years of generalship were each more than thirty and whose influence on the order itself and particularly on its educational development was so profound, were Italians. Indeed the great majority of those who held this high office were of this nationality and perhaps there could be no higher compliment paid to Italy as an educational centre than the fact that so many of its sons were chosen by the Jesuits of the world to this responsible position. Some of the leading spirits of the order and some of the great lights of its scholarship have at all times been Italians.

The great Roman college of the Jesuits was the training school of a large number of scholars whose influence was

widely felt throughout the world and whose learning included not only the sciences of theology and philosophy so often presumed to be the special subjects to which a religious order would devote itself but also Latin and Greek and above all science. Distinguished members of the order from all over the world were summoned to Rome to be the teachers in this great central school of the order. At all times the Jesuits have had some of the most distinguished scholars of the world at the Roman College and they have found there a favoring environment for their work in the ethical sciences or in physical science or in the elucidation of the texts of the classics or in the study of antiquities and of the oriental languages. To blot out of world publications the important contributions in many departments of human thought that had been made there would be indeed to leave a sad lacuna in human history. The story of some of their work has been told in the chapter on Italian Scholarship and in the chapters on Astronomy and Mathematics and the Biological Sciences. Other religious orders did not contribute so much in proportion as the Jesuits and yet gave many distinguished educators to the generations of the seventeenth and eighteenth centuries.

As a matter of fact it can not be too often emphasized that as we have said, for the seven centuries before the eighteenth whenever men in any country in Europe wanted to secure special opportunities for education on a more extensive scale than they could find it at home, or to find training in special departments that were not as yet developed in their own countries they invariably went down to Italy for that purpose. This was as true for Guy de Chauliac the Frenchman in surgery, as for Nicholas of Cusa and Regiomontanus, the Germans, in mathematics and Copernicus the Pole in Astronomy as well as for Vesalius the Fleming in anatomy, Linacre and Caius the Englishmen in medicine and the classics as for Harvey the Englishman in physiology and so on through the whole list. Italy was literally as Harvey greeted her when leaving Italy, the *alma mater studiorum* for the

world, until Napoleon's disturbance of European politics shifted the centre of interest to Paris for the first half of the nineteenth century and the rise of the Germanic Empire carried it up to Germany in our own time. Leyden was a serious rival of the Italian universities for a time in the seventeenth century, Paris was nearly always the second choice for students who could not go to Italy, but Padua, Bologna and Rome, continued for seven centuries to be the centre of educational interest for all the world, the magnet that attracted men occupied with practically all the branches of human knowledge.

In the modern time Italian influence in education has not been less, but even greater if possible than in the long ago. How many of the ideas of modern education can be traced back to that Italian school master of the early part of the nineteenth century Pestalozzi: Thomas Davidson emphasized for Americans how much the philosopher and pedagogic psychologist Rosmini meant for the presentation of modern ideas of education. In the twentieth century the personage who for the moment at least attracted the most and widest attention in education here in America was probably Madame Montessori. We may agree or disagree with any of the ideas of these educators, we may consider that they represent the passing fashion of a moment, or a climax of educational evolution, we may consider that their thought is trivial or of great significance, but we can not deny that their influence is widespread and that they have attracted more attention in their generation than any others. To be the leader of thought in one's own generation in any particular department is as much as any human being can wish for and it is ever so much more than any except a chosen few are ever able to attain. Italy was the leader guide and master of the world in the mental world for all the centuries of modern history down to the nineteenth. Even in the last hundred years she has not ceased to be the home of men and women who think seriously on educational topics and attract the attention of the world by their work.

FEMININE EDUCATION

STRANGE as it must seem to those who are inclined to think that this is the first time in the world's history that women have ever had the opportunity for the higher education and above all are quite persuaded that women's only intellectual opportunities have developed in the Western countries in Europe and especially in our own America, Italy is quite as far ahead of all the world in the chapter of education for women as she is in the educational opportunities provided for men. During the ancient Roman times the women of Rome occupied very much the position they hold in our time. When Christianity came, their opportunities were enhanced. During the earlier middle ages they shared all the privileges of the men even the franchise in most of the Italian cities. For the last eight centuries there has scarcely been a single generation when there has not been one or more distinguished women scholars teaching at Italian Universities, and while feminine education has had its ups and downs in the Peninsula, as has every mode of human culture everywhere in spite of the general delusion of constant progress, there has practically never been a period when a woman who genuinely wanted to get the higher education in Italy, no matter what the department in which she was interested, might not readily secure it.

The traditions in Italy that had come down from the old Roman days were then distinctly favorable to feminine education. There is a confused very general impression that women of the ancient times, that is, before Christianity or indeed before the Renaissance, were as a rule kept very strictly to their domestic concerns and not allowed to take

any serious interest in either the intellectual or political life of their times. This is supposed to be particularly true as regards the pre-Christian period. In Greece it is true that women were almost entirely confined to their domestic life, set apart from all their husband's outside interests, even dwelling in a particular portion of the house known as the women's apartments and scarcely ever appearing in public. As I have emphasized in my chapter on *The Women of Two Republics** any such notion with regard to the women of Rome is utterly false. One of the first books put into the hands of boys who learn Latin is *Lives of Illustrious Romans* by Cornelius Nepos. This well known Latin author said in a passage that Ferrero the Italian historian declared in his book on *The Women of the Caesars* to be "one of the most significant in all the little work:—

"Many things that among the Greeks are considered improper and unfitting are permitted by our customs. Is there by chance a Roman who is ashamed to take his wife to dinner away from home? Does it happen that the mistress of the house in any family does not enter the anterooms frequented by strangers and show herself among them? Not so in Greece: there the woman accepts invitations only among families to which she is related, and she remains withdrawn in that inner part of the house which is called the *gynaeceum*, where only the nearest relatives are admitted."

To a great extent the women of Rome enjoyed all the liberties accorded to women in our time. Cornelia's influence over her sons, the famous Gracchi, is well known. The mother lost both her boys, whom she had so proudly exhibited as her 'jewels' when they were younger, but she had the consolation of knowing that her sons had perished nobly in the struggle to secure and maintain the rights of the people and keep the few wealthy aristocrats from absorbing all the opportunities of life, leaving the great body of the people to almost hopeless poverty. It is now known that their careers were largely

* *Modern Progress and History*, Fordham University Press, New York, 1912.

shaped by her influence and she kept the memory of their life and work from perishing, gathering around her in what was really a great political salon at Rome about the middle of the second century before Christ a group of men and women who deeply influenced Roman life. Abbott in his "Society and Politics in Ancient Rome" says that "Through her the cause for which Tiberius and Gaius(her sons) died, lived after their death. We may well believe that some of the men who carried on their reforms went out from this little circle about Cornelia."

Mrs. Putnam in her book *The Lady* in the chapter on Roman Ladies tells the story of what happened to the women of Rome when wealth flowed into the city and Eastern luxury came to replace Roman simplicity and through the Roman woman "society" was organized for the first time in Europe. Mrs. Putnam said "A woman of fashion, we are told, reckoned it among her ornaments if it were said of her that she was well read and a thinker and that she wrote lyrics "worthy of Sappho." She had her hired escort of teachers, indulged in literature, cultivated what is called "club life" in our time, read her verses to her companions and for her the *vers de société* were expanded and the novel originated, for women became a large element in the reading public. We have not any great literary achievement from the women of the time, but this dearth of good literature by feminine writers was evidently not due to any lack of opportunity or of the leisure for it or of any deterrent discouragement. Indeed as Mrs. Putnam insists the intellectual life of the Roman women resembles that of the women of our own time so closely as to be almost identical in its apparent opportunities yet manifest failure.

It was into this state of freedom for women that Christianity came at Rome and while for several centuries because of persecution Christian lives were necessarily lived too entirely in the background for us to have any remains of the intellectual accomplishment of Christian women, we know that from the very beginning woman was encouraged rather

than discouraged in service for the community. The order of Deaconesses was established and training for the care of the ailing and for the Christian education of children was developed. As soon as the Church acquired a position in which it could influence the public life of the time, we find in the association of St. Jerome with Eustochium and Paula definite evidence of the Christian feeling as regards feminine education. The foundation of the monastery at Jerusalem, where these learned women helped St. Jerome in his work and where many other women must have obtained the chance for similar tasks, can scarcely have been a unique example of the opportunity afforded thus early in Christianity for women who felt no inclination to marry and who had a vocation to the intellectual and spiritual life, to take it up, in this way, with guarantees for the future and for their old age.

St. Jerome's letters on the education of young girls show that Christianity was guarding morality, but encouraging rather than discouraging education for women. This was even more strikingly exemplified in Ireland in the next century when St. Brigid who founded the school at Kildare came to be revered only next to St. Patrick himself. When the coming of the Teutonic tribes into Italy, the Invasion of the barbarians as it is called in history, occurred, there was for several centuries very little opportunity for anything like organized education or the cultivation of the intellectual life. Men lived perforce in the crippling grip of wars and political disturbances. As ever when an inferior civilization comes in intimate contact with a superior civilization, the ruder people take first the vices and only after a long interval as a rule the virtues of the higher state. The prepondering mass of the population from the North, where they had lived in savage simplicity, were carried away by the superficial satisfactions of civilization around them and indulged in all its pleasures without realizing its duties and the necessity for self control. It took centuries for the Church to bring the new order of things which resulted, genuinely under the

influence of Christianity and in the meantime the intellectual life of Europe disappeared almost completely.

In these unfortunate conditions Benedict of Nursia, tired of the madding crowd, withdrew from the world where all was distraction and "the witchery of trifles which obscures good things" and sought to live his life in peace and quiet, following the maxim of Descartes a full millennium later *qui bene latuit bene vixit*, he who has hidden himself well has lived well. Other young men, however, discovered Benedict's secret of happiness and satisfaction with life and came to live near him finally in such numbers, that he had to organize his religious order and give it the constitution or rule which shows so clearly that he was a statesman as well as a saint and a scholar in the best sense of the word.

Not long after the founding of the Benedictine monasteries, Scholastica, Benedict's sister established the Benedictine nunneries. Women asked and obtained similar opportunities for the intellectual and the spiritual life as had been secured for men. The Benedictine nunneries became in sadly disturbed times homes of peace which provided for women, who desired it, the fullest opportunity for study and for occupation with the things of the spirit consonant with community life. Probably no institutions have ever been more misunderstood by a great many people of modern times than the nunneries. In English speaking countries particularly it has been the rule almost to assume that very little of any significance was done in convents, and that they were mainly homes for women without initiative and without desire or ambition to do anything in life, who sought in them shelter and peace in idleness or the chance to live their lives so occupied with trifles that practically nothing was accomplished. None of all the false impressions of history could well be less true or less representative of realities than this. The nunneries were practically always as they are at the present time, busy hives of industry, with absolute regularity of life, early rising for a long day, short sleeping and every hour with its serious occupation assigned. Sometimes the nunneries

have fallen from this high estate and purpose, as every human institution is fated to do, but such descent has been ever so much rarer than is often thought. The most interesting reflection with regard to them is that it was always when nunneries were less strict, relaxed as it was said, that the numbers of the religious began to fall off, while every new reformation with tightening of the bonds of religious life increased the number who applied for admission.

The nunneries of the Benedictines became like the monasteries of their masculine brethren, centres of culture and education and above all opportunities for happiness for a great many people. The peasants who lived around the nunneries were helped with their agriculture and many an abbess proved a magnificent administrator of immense estates. As a consequence they were often summoned for consultation by government authorities and letters of advice were asked from them. They were given a seat in the English Parliament and a place in the government of other countries, in the days before the Reformation, and going to a nunnery became as much a vocation with definite purposes in life as any worldly occupation of the modern time. A certain number of women at all times feel a disinclination to matrimony, or at least never meet the man to whom they would care to confide their happiness and the direction of their lives. As St. Teresa said of herself, they do not mind obedience but they hesitate about having to obey one man all their lives, and yet they recognize that if there is to be any true happiness in a home there must be one head of it. For this always large number of women in every generation, the Benedictine nunneries founded by St. Scholastica provided an excellent resource.

In these nunneries they occupied themselves above all with the study of that fount of good letters, the Scriptures, but not with mere sterile critical study of the text, but with the deep spiritual human significance of the Holy Writ. It need scarcely be said how much that meant for genuine literature. It is a surprise for most people to know, that even in the tenth century when the intellectual life of Europe was, as a result

WHAT CIVILIZATION OWES TO ITALY

of the transmigration of nations at its lowest ebb, a Benedictine nun, Hroswitha of Gandersheim wrote a series of dramas for the monks and nuns of the time. A still greater surprise, however, is to find the reason why she wrote these dramas. She says in her preface that so many of the religious of the time were reading Terence for the sake of his style as they declared, though there was so much in him that was disedifying and dangerous for Christians, that with the consent and encouragement of her superiors, she wrote these dramas in order to supply reading that would be less dangerous than that of the classic Roman dramatist. She also wrote a series of chronicles that are well known. The chronicles of the convents were kept just as faithfully as those of the monasteries and represent important sources of history. They also did copying, their libraries* were famous and they provided opportunities for the girls of the lower and middle classes with intellectual aspirations to obtain mental training. All this organization of feminine opportunities is due to the Italian lady of the sixth century, Scholastica, who founded the Benedictine convents.

How much this convent life meant in the provision of intellectual opportunities for women, in spite of the rather contemptuous feeling with which they have been regarded, has only begun to be properly appreciated generally in quite recent years when definite, special study has been devoted to them. The better the convents are known the more we have learned to recognize how much they accomplished and the more any given writer knows about them the higher is the praise of them.

Lena Eckstein in her work on *Women Under Monasticism* went so far as to declare that "the career opened to

* Miss Bateson has published the catalogue of the Briggittine Monastery (convent) of Syon in England, famous for its cope, one of the most beautiful pieces of needlework in the world. This is one of the few such catalogues preserved but it provides ample evidence of the breadth and be it said the depth of the intellectual interests of the nuns of the later middle ages. The Briggittines are named after St. Bridget, Queen of Sweden who founded them. In the days when Sweden and England were in close political relations and their royal families intermarried a number of Briggittine communities were founded in England.

the inmates of convents in England and on the Continent was greater than any other ever thrown open to women in the course of modern European history." She ventured to say further "The contributions of nuns to literature as well as incidental remarks show that the curriculum of study in the nunnery was as liberal as that accepted by the monks and embraced all available writing whether by Christian or profane authors. . . .Throughout the literary world as represented by convents the use of Latin was general and made possible the even spread of culture in districts that were widely remote from each other and practically without intercourse."

Miss Eckstein is not alone in this surprising estimation of the old nunneries — as it must be to ever so many people — for others who have studied the subject as seriously as she has done, share her views.

Mrs. Emily James Putnam whose position for years as Dean of Barnard College the women's department of Columbia University, N. Y., gives the assurance of her capacity to judge and at the same time would guarantee against any partial judgment in favor of the convents as compared with other and more modern educational institutions, has used some rather strong expressions with regard to the place held by the religious life in all that concerns feminine intellectual development in the past and she does not hesitate even to contrast it with our institutions of the present day and surprisingly enough more than a little to the disadvantage of the modern college for women. In her book on *The Lady* (New York 1910, page 71) Mrs. Putnam said "No institution of Europe has ever won for the lady the freedom and development that she enjoyed in the convent in early days. The modern college for women only feebly reproduces it, since the college for women has arisen at a time when colleges in general are under a cloud. The Lady Abbess on the other hand, was part of the two great social forces of her time, feudalism and the Church. Great spiritual rewards and great worldly prizes were alike within her grasp. She

WHAT CIVILIZATION OWES TO ITALY

was treated as an equal by the men of her class, as is witnessed by letters we still have from Popes and emperors to abbesses. She had the stimulus of competition with men in executive capacity, in scholarship, and in artistic production, since her work was freely set before the general public; but she was relieved by the circumstances of her environment from the ceaseless competition in common life of woman with woman for the favor of the individual man. In the cloister of the great days, as on a small scale in the college for women to-day, women were judged by each other as men are everywhere judged by each other, for sterling qualities of head and heart and character."

The first formal beginning of feminine education of university scope came, as we have already said, down at Salerno where the most important department of the university was the Medical School in which the special department of women's diseases seems to have been placed in the hands of women. The presence of women at this university as teachers and evidently as pupils in large numbers, must be all the more surprising to most of our generation because the principal influence in the educational developments at Salerno came from the neighboring Benedictine monastery of Monte Cassino and indeed the preliminary teaching at the University in the under-graduate courses seems to have been at all times almost entirely in the hands of the Benedictines. Monastic influence usually is supposed to be almost inevitably opposed to feminine education, but it is needless to say to those who know anything about the subject that any such supposition is quite without foundation in the history of monasticism. The Benedictine nuns were organized almost exactly like their brother monks of the order. The greatest possible independence was given to women in the monastic life, they elected their own superiors and they made their own rules, subject only to the approbation of the Church authorities as in the case of the men, managed their own worldly affairs and even sat in parliament and in various governmental bodies as representatives of their estates, exercising all the rights and

privileges, sometimes though very wrongly, supposed in our time to have always been monopolized by the men.

In these Benedictine convents women were trained particularly in the care of the ailing. Many of the houses were large, containing hundreds of inhabitants, sometimes situated at a considerable distance from a town, so that a physician's services were not readily available and the infirmarians had to be especially trained in the care of the sick. The peasants on the convents' estates also looked to their religious friends for help in times of sickness and the monastery and nunnery gardens always contained the herbs and simples from which the favorite herbal medicines of the time were made. It might be thought that the instruction afforded these infirmarians would be of the slightest and that they would depend on a body of traditions that meant very little for true medicine. The most important works that we possess from these old Benedictine nunneries however, is the *Liber Simplicis Medicinal* and *Liber Compositae Medicinæ* written by the Abbess Hildegarde of Gandershiem, which has been declared by good authorities to be the most scientific work of the century in which it was written, the twelfth.* She gathered together information that had been accumulating in convents along the Rhine for many generations, added much of her own and published it. What nuns did in Germany however was only a repetition of what had long been the custom in Italy, for the German Benedictine convents were foundations from Italy. It is not too much to assume then that the same state of things prevailed in Italy, though the political disturbances of the peninsula have obliterated the evidence of them, to a great extent.

Among the Benedictines themselves Scholastica's convents were coordinate not subordinate to those of the men. Everywhere they were treated on a footing of equality and while the Benedictine monasteries often provided their spiritual advisers and supplied them with special teachers and with books for their libraries and represented the "big brothers" to whom

* See Lipinska, Paris Thesis 1900 (crowned) *Les Femmes Mediciens*.

they might have resource in their difficulties, there was never any direct authority exercised over the convents, except by those elected by themselves and of course the higher ecclesiastical authorities.

With all this in mind it is easy to understand that the wise Benedictine monks seem to have realized how advisable it was to put the department of women's diseases at Salerno into the hands of women professors and to have encouraged this special development of medical education which provided the many women physicians whose licenses are registered from the neighborhood of Naples.

Some of these women at Salerno wrote text books on the subject of women's diseases that became famous throughout Europe. The work of one of them, Trotula, was very widely known and indeed her name as Trotula, or Trot, or in other variant forms was in succeeding centuries taken as a symbol of the learned woman of every country and time. De Renzi in his *Story of The School of Salerno*, has many details with regard to this medieval woman university professor. She belonged to the family of Ruggiero of the Salernitan nobility and was the wife of John Platearius I, who was the Professor of Medicine at Salerno, so-called because there probably were three professors of that name. Trotula was the mother of Platearius II, who succeeded his father in the professorship.*

We have some of Trotula's books one of which bears the subtitle *Trotula's Book of Experience (Liber Experimentalis) in the Diseases of Women Before, During and After Labor with other Details Likewise Relating To Labor*. In my *Old Time Makers of Medicine* I have quoted some passages from the book which show that in spite of the facile supposition of our time that a physician of the eleventh century could scarcely be expected to know anything worth while about women's diseases, Trotula provided many practical hints for

* It was only later and mainly in the West that Universities became celibate institutions, establishing rigid laws as to the non-married state of teachers and fellows. Italy never yielded to this intolerant spirit which hampered feminine education very much in the West, probably being initiated by the unfortunate Abelard and Heloise incident at Paris, for Paris bore a sort of maternal relation to most of the universities of Western Europe.

FEMININE EDUCATION

the care of the mother in such things as diet, exercise and the rule of life before and after labor and for the diet and regulation of the life of the child. Her books have been printed in a number of editions, and her work has been reviewed by Mdlle. Lipinska in her Paris Thesis on Women Physicians. We have the names of a number of others who taught and wrote on medicine at Salerno as for instance Mercuriade who wrote On Crises, on Pestilent Fever, On The Cure of Wounds; Abella who wrote on Black Bile and Rebecca Guarna who wrote on Fevers and on the Embryo. The School of Salernitan women came to have a definite place in medical literature. As late as 1415 Constanza Calenda was the Dean of the Faculty of Medicine at Salerno.

It is a great surprise perhaps for people in our time to think of women physicians of Italy in the Middle Ages since it proved so difficult for women to secure once more the privilege of medical study in our time, but this surprise is founded on ignorance of medieval ways of doing things. They were an intensely practical people, particularly in all that concerned social problems. The formula of the preamble of the license, granted to women to practice medicine in Italy in the medieval period ran as follows: "since then the law permits women to exercise the profession of physicians, and since, besides, due regard being had to the purity of morals women are better suited for the treatment of women's diseases, after having received the oath of fidelity we permit, etc." Nicaise in the Introduction to his edition of *Guy de Chauliac's Grande Chirurgie* reviews briefly the history of women in medicine and concludes: "Women continued to practice medicine in Italy for centuries, and the names of some who attained great renown have been preserved for us. Their works are still quoted from in the fifteenth century."

Up at Bologna during the first century of the University's existence there were women professors or assistant teachers in practically every department. Irneria was her father's assistant in the department of law when the great law school at Bologna acquired the fame which gradually led to the

WHAT CIVILIZATION OWES TO ITALY

establishment of a university there. We have the record of a woman professor of mathematics there, as well as of philosophy and literature. Even more surprising is the fact that the assistant to the great professor of anatomy Mondino who re-introduced the regular practice of dissection into medical teaching was a young woman, Alessandra Giliani. She was engaged to be married to the prosector of Mondino, but unfortunately he died before the marriage and she followed him not long afterwards, both the untimely deaths being perhaps a consequence of some of the infective accidents that must have been so common in the dissecting work of that time. Before her death, however, she had invented a method of injecting bodies in order to preserve them and lessen to some extent the deterrent work of dissection. Curiously enough it was another Italian woman, Madame Manzolini, assistant to Galvani, some five centuries later to whom we owe the first use of wax models, colored to imitate tissues so that anatomical studies might be made from them without the necessity for constantly recurring to dissections. Not a century has passed since the thirteenth in which there have not been women professors at the universities of Italy, not a few of them reaching distinction in the academic world.*

With the coming of the Renaissance there was a great new awakening of education in Italy in which the women shared to the fullest extent. The first great Renaissance teacher Vittorino da Feltre took up the position of teacher for the Gonzagas at Mantua on condition that women should

* The question of how many women students there were in attendance at the University of Bologna has often occupied the attention of historians of education. It might be thought that a glance at the registers of the University itself would decide this question once for all, but they only serve to show why it has remained a non-solved problem and is likely to continue so probably forever. It was not the custom at that time in giving baptismal names to distinguish so accurately between masculine and feminine names as it has become since though the Latin nations especially Italy have a great many boys who received feminine names. Not a few girls were given masculine names. A child of parents of any but the very lowest classes always received several names with what we would think a mixture of sex in them. Mary was a very common name as the first baptismal name for both boys and girls. In Venice the custom obtained of giving every child whether boy or girl no matter what other names were given by parents the two names John, Mary, which were those of patrons of the city. Similar customs obtained in some other Italian cities so that it becomes easy to understand then that an examination of the registers of Bologna with the idea of determining just how many masculine and how many feminine students there were from the list of names is quite futile.

FEMININE EDUCATION

be allowed to attend his classes as well as men and that poor students who wished to attend should also be admitted. His influence was so wise and deep that it is not surprising that following the example set by him everywhere else in Italy women were given opportunities for the study of the New Learning as it was called. Everywhere we find abundant evidence not only of the provision of opportunities for feminine education, but also as to how well these opportunities were taken advantage of. It came to be understood that the young women of the nobility and particularly the reigning houses should know Latin well, some Greek, should be able to write Italian verse and often know at least one other modern language. An ignorant woman was considered to be without charm. Cardinal Bembo declared that "the more a young woman knew the more charming she was." It is easy to understand that with the upper classes thus interested in education the middle and lower classes came as always to imitate them just as far as possible.

Nor was all the organizing of education for women in Italy in this precious Renaissance time done only by men. A great woman educator, whose work has lived after her down to our time and has shown its power to fit itself to varying conditions, was born in the little town of Desenzano in the early sixteenth century. She organized a little school for girls in her native town and was so successful that she was called to Brescia to develop a school system and was summoned to Rome by the Pope who wanted her to develop her work from the centre of Christendom. She pleaded to be allowed to go back to Brescia to perfect her system and gathered around her a number of young women who devoted themselves to the service of feminine education. Soon she realized the necessity of a permanent organization and so her religious order was founded which her companions wanted to call Angelines after her name Angela Merici. She chose the name of Ursulines, however. When her constitutions were sent to Rome, for approval, Pope Paul III, who had often said that the number of religious orders must be reduced rather than

WHAT CIVILIZATION OWES TO ITALY

increased, was struck with the practical common sense outlined in the new institute and approved them. According to tradition as he signed the new constitution for the Ursulines the Pope said to St. Ignatius Loyola, whose advice he had asked and whose constitutions for the Jesuits he had approved the preceding year, because as he said himself he felt that the "finger of God" was in them;—"Now I have given you sisters." The two orders were to have magnificent success as teachers and were to be partners in persecution whenever any serious attempt was made to discredit religion. At the present time the Ursulines have houses all over the world and missionary schools among savage peoples, in Africa, Alaska, among the Indians of South America, as well as in East India and in China. They have schools all over the United States and when the movement for the higher education of women developed they were ready to open the first Catholic colleges for women. They have succeeded admirably everywhere. Literally hundreds of thousands of women every century since her death, now nearly 400 years ago, have been educated according to the principles which this modest Italian woman saw so clearly and established so firmly in her institute. Every century since, too, thousands of women have found a precious life work following the simple duties allotted to them by her rules and constitutions which yet afford ample opportunity for the development of the highest administrative ability and intellectual talent whenever these may be present. Literally thousands of women have found happiness in life following in her footsteps.

When the needs of the Italian emigrants to the two Americas in the early nineties of the last century came to be particularly demanding, a little Italian woman had the inspiration to organize a series of institutions for the care of these poor foreigners so little understood who needed so much the sympathetic guardianship of their own people. This was Mother Cabrini to whose care, after he had seen her work among the poor in Italy, Pope Leo XIII commended the Italians in the two Americas. She came to New York some thirty

years ago and absolutely without means proceeded to organize her work. She founded Columbus Hospital and then another of the same name in Chicago, as well as hospitals in Denver and Portland, Oregon. She organized hundreds of schools and gathered round her several thousand young women, many of them Italians, but many more of them of all nationalities to help in her task. It was a never ending surprise to see the marvelous influence which she exercised over men and women. The young women who became her companions in her work fairly revered her. The task of organizing the care of the poor Italians in the United States would seem to be enough for anyone, but Pope Leo XIII had said "the two Americas" and so Mother Cabrini proceeded to perform a similar task for the Italians in South America. She had herself carried over the Cordilleras from Argentine to Chili on mule back and disappeared for a time over the edge of a precipice, but pushed on with her labors to a successful conclusion.

When, after thirty years of labors she was carried off by hemorrhage at the age of 67 she had created a great institution for social service of all kinds among the Italians and left behind her a name that will be famous forever in the history of Italian emigration. In our time, usually supposed to be barren of such successful efforts, she did work that parallels in many ways that of Angela Merici in the Renaissance and it would seem as though five hundred years from now it will still be as great a living factor for civilization as that of so many other Italian women whose example proved an incentive to others in their own generation, and whose work proved an opportunity for the young women of many succeeding generations to find a vocation that satisfied mind and heart and soul in the care of others.

ITALIAN SCHOLARSHIP

WHILE Italy has done so much for systematic education the debt of the world to her is almost greater for what she has done for efficient scholarship, that is not for dry-as-dust accumulation of knowledge for its own sake, but for that productive erudition which makes it easier for other men to enjoy the fruits of knowledge garnered in previous generations to better advantage or which enables them to appreciate more fully the great thoughts that have occupied men in ancient times. Italy has done more for the printing of magnificent editions of the classics, valuable for their scholarly collection of the best available texts, their helpful apparatus of notes and commentaries, their arrangement, paragraphing and punctuation (how few readers realize that we owe all this to the early printers and the first editors,) as well as the material form in which they were presented, their printing, binding and the rest, than any other nation.

What the Alduses did at Venice and what was accomplished by the great printers of incunabula at Rome, Florence, Naples and the other Italian cities, represents a magnificent heritage presented to mankind by Italian scholars who were willing to spend their days and nights in toil in order that other men might the more easily reap the fruits of scholarship. The more one studies what was accomplished by Italian scholars of the Renaissance in this matter, the more one realizes the depths of the obligations to them under which the world lies for scholarly work. Besides editions of the great authors, dictionaries, geographies, commentaries of all kinds, explanatory manuals of all sorts have come from these Italian scholars, and their value is recognized by the world of

erudition. More modern scholars have taken advantage of their work until often it is buried so deep as to escape proper recognition, but that is the way of all fundamental work such as theirs was.

If the Italians had done nothing else for scholarship than what they accomplished during the Renaissance time they still would have deserved the highest place in history for merit in the department, but as a matter of fact at all times during the Middle Ages, Italy was in a fine scholarly way greatly contributing to the education of Europe both for the time and for subsequent generations. They were preserving the classics by collecting libraries and copying and illuminating manuscripts thus giving them an added value that would more surely contribute to their preservation. They were making commentaries on them and attracting attention to them by references. Long before printing in the earlier Middle Ages Boethius' *Consolations of Philosophy* was an important scholarly work and Cassiodorus collected manuscripts and arranged for their copying in his monastery as well as for other modes of diffusion of classical knowledge. Monastic libraries especially in Italy saved the classics during the darker period of the ninth and tenth centuries and the monks and nuns kept alive a flame of intellectual life and carried on the torch of education, while men were occupied with the sordid materialism of war and looting during the period when barbarism was slowly giving way to civilization.

It was in Italy that the universities at the end of the Middle Ages and above all in the Thirteenth Century, which has come to be called the earlier Renaissance, proved to be centres of scholarship and erudition, of collections of books into libraries, of the making of copies and commentaries that were to mean so much for the after time. How highly they valued this work can be seen from the magnificent editions with illuminations which they issued and the large number of fine copies that were made. In spite of seven centuries of destruction by fire and flood and war and above all by the neglect that unfortunately came for these precious treasures

after the invention of printing, there are so many copies of the classics still extant as to give an excellent idea of how zealous the Italians must have been in their work of producing manuscript copies. From Salerno and Bologna and Rome and Padua and Messina literally hosts of scholars went all over Europe and even to the near East and the northern coast of Africa to spread the good tidings of the great university revival of learning which took place in Italy.

It is for what was done in what has been called the period of the revival of learning that the world is most indebted to Italy. The Renaissance, as it is often called, is usually considered to follow the fall of Constantinople in 1453. We have been putting the date of it back farther and farther, however, and it is now recognized that it should begin not later than the death of Dante in 1321 and that it is practically over at the death of Pope Leo X in 1521, and definitely finished by the sack of Rome in 1527. During these two centuries, the productive scholarship of which begins with Petrarch, the main purpose of scholars was the imitation of the classics. When Dante died, Petrarch, the first of the humanists was still a young student at Montpelier, but he was already enraptured with the style of Cicero and Virgil. He studied his beloved Latin authors when his father supposed he was studying law. Virgil and Cicero were his favorites but he came to appreciate Horace and especially the lyrics of the Roman poet very thoroughly. Virgil had been the favorite author of the Middle Ages and through Petrarch's influence Cicero came to occupy a high place in education and scholarship.

Petrarch was ready to spend time without stint in the unearthing of any of Cicero's lost writings. He discovered in 1333 two hitherto unedited orations at Liege and then had the supreme happiness of finding the letters to Atticus. The many friends that Petrarch made, his devoted studies, his immense correspondence and his constant enthusiasm accomplished untold good for classical studies. He did not appreciate Greek properly and yet he prepared the soil of Italy for the reception of Greek culture.

ITALIAN SCHOLARSHIP

Boccaccio is second only to Petrarch in what he did for the revival of learning. He visited the libraries of monasteries where he found precious books, treasures, neglected in some places, but where he succeeded in arousing interest and stimulating others to take up the work of conserving the classics. Boccaccio was always the type of the scholarly gentleman, so frequently met after his time in Italy. The Chancellor of Florence declared after his death that he had never known a more lovable being than Boccaccio. Boccaccio had a liking for Greek, supported a Greek teacher for three years in Florence in his own house engaged in making a translation of Homer, and had himself a fancy for giving Greek names — some of them very curiously and clumsily compounded it must be confessed — to his Italian works. He was the awakener of the modern world to Greek studies.

During the century from 1350 to 1450 a series of Greek scholars were kept busy teaching Greek, editing Greek books and elucidating Greek manuscripts in Italy. Italian noblemen and wealthy merchants, the ecclesiastics and the monasteries welcomed them and provided them with opportunities for scholarly work denied them in their own troubled country. Only for this preliminary patronage of Greek studies the revival of learning would have been very much delayed, even after the fall of Constantinople.

It was not long moreover before the Italians themselves began to do this scholarly work as rivals of the Greeks. Such men as Poggio Bracciolini, Filefo, Landriani, Politian, the Sicilian Aurispa, Ciraco de' Pizzicolti of Anconia, who has been called the Schliemann of his time, a self taught student who spent all his life in traveling, not only for the purposes of trade but also for the collection of objects of archaeological interest, Flavio Bondi of Forli and many others who did most of their work before the fall of Constantinople, show how thoroughly Italy had awakened to classical studies in the first half of the fifteenth century. Traversari, Manetti, Leonardo Bruni, Marseppini, Vergerio and Guarino as well as Vittorino da Feltre, are names that deserve to be remembered

forever as they doubtless will be, because of their devotion to humanism, their collection of manuscripts, their teaching of many students, their own enthusiastic absorption in the New Learning and the conveyance of their enthusiasm to others.

Above all, as I have said, the printing of the classics in Italy put the world under a debt to Italian scholarship that can never be fully repaid. Already even before the days of printing such a man as Vespaziano da Bisticci had made himself famous throughout Europe for being able to supply manuscript materials to those who wanted them. It is on record that he supplied orders for codices of various kinds for Hungary, Portugal, Germany and England, and he was the trusted agent of the three greatest book collectors in the fifteenth century, Cosimo de Medici, Pope Nicholas V and Duke Frederick of Urbino. He came to be better known in his time and deservedly than any of our modern bibliophilic experts and was famous for his ability to secure beautifully bound books as well as good copies. Vespaziano recalled the fact that after the invention of printing the Duke of Urbino wanted all his books done with the pen because "he would have been ashamed to possess a single printed book." The new mode of reproduction smacked of "machine-made goods," as it were, and the Duke wanted his hand-made. But the old order was to change and Italy was to be foremost in the making of beautiful printed books.

Doubtless many people are prone to think of the wealthy amateur and collector of art and beautiful books and fine examples of the arts and crafts of our time as distinctly a modern development. Anyone who knows the careers of the merchant princes of Italy in the Middle Ages and during the Renaissance will not be likely to think so however. The first famous member of the Medici family, Cosimo, was a banker, traveller, literateur, collector, connoisseur, liberal patron of all the arts with a spirit thoroughly appreciative of every form of intellectual development. Our modern wealthy collectors seem quite narrow in their interests, but above all almost sordid in their enthusiasm for mere rarities compared

with him. Not only did he like art and spend money on it, but he could discuss philosophy, or Greek, or Latin letters, or even divinity with intelligence and discrimination; above all, he did not merely collect what preceding generations had proclaimed to be good, but tried to help the artists of his own time in every line. He employed Michelozzo to build his palace now known as the Riccardi, one of the most beautiful of such buildings in existence; he furnished most of the funds for the erection of the cathedral of San Marco; employed Brunelleschi to rebuild the abbey at Fiesole and commissioned Fra Angelico to decorate San Marco and Benozzo Gozzoli to decorate the private chapel of the Medici. No succeeding record is equal to that; perhaps Pericles is his only serious rival and the Grecian statesman's work was accomplished through the resources of the state, not his personal fortune as in the case of the Florentine.

Cosimo de' Medici's interests were not confined, however, to a palace for himself and to religious structures, though what he did for these would seem to provide occupation enough for most cultured minds in any life time, but he arranged for the construction of several library buildings in Florence and one in Venice. He devoted as much attention to the subject of libraries as any of our modern millionaires, was ready to pay good prices for books, arranged for the collection and copying of them, and wanted as many places and people as possible to share in the benefits to be derived from them.

Almost needless to say these interests required the expenditure of large sums of money. He had made immense sums in his business, however and was quite willing to spend liberally. Toward the end of his life he declared that the one idea that still gave him a scruple was his regret that he had not begun to spend money liberally ten years before he did, rather than go on accumulating it. We think of the expression of an American millionaire that it is a disgrace to die rich as characteristically modern. Cosimo de Medici apparently had the thought rather poignantly in his time. As the years

WHAT CIVILIZATION OWES TO ITALY

advanced and old age came on he often sat alone in deep thought. His friends and relatives, particularly his women folk, were afraid that he was becoming despondent and wondered what he did with his hours of silent meditation. Finally one of them ventured to question him with regard to them and what he occupied himself with at these times. He asked her if she were going on a long journey would she not occupy herself very much with preparations for it? He was making his preparations for his last long journey. He was very much devoted to the ethics of Aristotle and it is said to have been the last book that he read with deep attention.

After the story of his career even thus briefly put, one understands better why he should have been called *Pater Patriae*, "Father of his Country." His influence was deeply felt in every phase of Florentine life for all that was best in her intellectual development. It has often been declared that the commanding influence he acquired for himself and his family through his wealth hurt Florence in a political way. In our times of democratic ideals it is easy to think that this must have been the case. The Medici held no office but were the "bosses" in our familiar phrase, of the municipality. As a result of their activities the republican government was less ideal. Mankind seems however often to get on better under a benevolent autocracy and Florence certainly furnishes an example of what may be accomplished for culture even under such informal patronage.

At all times the Popes were scholarly patrons of learning and even when themselves not distinguished for scholarship, gathered scholars around them as a rule and encouraged education. A number of great Popes did so much for scholarship in Italy during the revival of learning that their names will always be associated with it. Nicholas V laid the foundation of the Vatican Library, employed a large number of copyists to make copies of the classics just before printing came to simplify this matter of the multiplication of books and did everything to encourage scholarship. Pope Pius II whose name Aeneas Sylvius Piccolomini is famous forever in the



RAPHAEL, POPE JULIUS II

annals of scholarship, was himself a distinguished scholar who owed his advancement to the Papacy not a little to his reputation for scholarliness.

While he himself had little opportunity to encourage and patronize literature, devoting himself rather to the great task of bringing the Christian nations together to keep out the Turks, for he realized that Mohammedan conquest would indeed mean the end of all good letters, his elevation to the Papacy was a magnificent tribute to the scholarship of the time and contributed greatly to lifting it into popular estimation. Sixtus IV who also did very much for the Vatican Library and after him the series of great Popes who during the next hundred years encouraged the setting up of printing presses in Rome and the multiplication of books, themselves contributing not a little to the expenses of good bookmaking, made Italy the most important place in the world at this time for scholarship.

The Papal Secretaries and the librarians at the Vatican were chosen with special reference to their scholarship and such men as Bembo and Sadoletto not only lent prestige to these positions, but brought the scholar as such into world prominence. Under Pope Julius II these two, who eventually became Cardinals, with Vida, laid the foundation of that fruitful scholarship which further developed was to throw so much lustre on the age of Pope Leo X. It was at this time particularly that scholars from all over Europe came down to Italy to take advantage of the magnificent opportunities provided by the Italian schools and scholars. Linacre, John Caius, Dean Colet of St. Paul, Erasmus, all were willing to acknowledge how much they owed to Italy. Erasmus wrote to one of the Cardinals that "the river of Lethe alone would wash out the memory of the delights of Rome." To another Cardinal he wrote that he recalled with regret the libraries, the scholarly conversation and the theatre which he had enjoyed so much while he was in the Papal City. The Roman Academy flourished at this time and such men as Platina, the future Librarian of the Vatican and Sabellicus, the future

WHAT CIVILIZATION OWES TO ITALY

Prefect of the Library of San Marco in Venice were among its members.

Some of the great Italian scholars bear names familiar to everyone who has studied the history of education and represent some of the broadest erudition in modern history. The great architect, Leon Battista Alberti found the inspiration for his architecture in the study of the classics and is a type of the practical Italian scholars who knew how to apply their knowledge so well and whose erudition was never a burden to them. They had none of the tendency to miserly accumulation of details of erudition that characterizes the dry-as-dust scholar. His contemporaries were such men as Ficino the fine productive student of Plato, the magnetic centre of the Academy at Florence, who translated and expounded Plotinus; Landino, tutor with Ficino of Lorenzo de' Medici, and Politian poet, teacher and editor. Another of these great Florentine scholars of this time was Pico della Mirandola, whose reputation for scholarship has become almost proverbial. He died in 1494 at the early age of thirty-one, possessed by the great thought of the unity of all knowledge and absorbed in planning a vast work which was to form a complete system of Platonic Christian and Cabalistic lore. The proof of his intellectual capacity is that he deeply influenced Sir Thomas More and many of the well known English scholars of the time, though living only to an age when it is ordinarily presumed to be quite impossible that a man should have acquired such scholarship as would make his influence deeply felt on profound scholarly minds.

In the year of Pico's death, 1494, Politian equally as great in reputation for scholarship, died at Florence at the early age of forty. When but thirty he was tutor to Lorenzo de Medici's children as well as Professor of Greek and Latin literature in Florence. Among those from England who attended his lectures were Grocyn and Linacre. Some idea of his erudition may be gathered from the fact that he was deeply interested in the textual criticism of Terence, Lucretius, Propertius, Ovid, Statius, and Ausonius as well as Celsus,

Quintilian, Festus, and the *Scriptores Rei Rusticae*. In addition he had made a special study of the Pandects of Justinian and the influence of his example did much to prevent narrow specialism gaining any ground among the Florentine scholars of this time. He denounced the so-called Ciceronians who refused to employ any word or turn of phrase not found in the Roman orator, as mere apes of Cicero and said "I am not Cicero, what I really express is myself." He wrote Greek poems at the age of seventeen and his first translation of the four books of the Iliad, finished before he was twenty, gained him the title, of which he was rightly so proud, of *Homericus Juvenis*. When his great patron Lorenzo the Magnificent died, Politian could not contain his grief. He followed his patron to the tomb only two years after.

Probably Italy's most important contribution to the intellectual life of modern Europe came from the great printers of the Renaissance period. The Manutiuses of Venice were particularly active with their presses and thorough in their work. They themselves were scholars and they gathered round them scholarly men from every country who helped to edit the wonderful *Editiones Principes* which appeared at the end of the fifteenth and the beginning of the sixteenth century. Many an important work of the Middle Ages and undoubtedly some even of the Greek and Latin classics would have disappeared during the sterile intellectual period of the late seventeenth and early eighteenth century only that the multiplication of books by Italian printing presses during the fifteenth and sixteenth century had made it practically impossible for texts to be lost. The scholarly work done in the preparation of these texts, the immense amount of labor involved, the educated judgment so often exercised, the careful collation of texts whenever that was possible, show how thoroughly the Italians of the Renaissance took to heart the work of providing suitable printed books for their libraries and for private use. The rare books for which now high prices are often paid and that are the valued treasures of great libraries were more largely the fruit of Italian printing presses than

of those of any other country — and the Italians were the leaders. Others who came after them had the example of the Italians to stimulate them and their diligence to emulate.

Some of the Italians who are famous for quite other reasons must also be counted among the world's great scholars. Deservedly we think of Aldus Manutius as the greatest of printers, but he was besides a very great scholar, the founder of the New Academy called after his name *Aldi Neacademia* in which all the members were required to speak Greek among themselves under penalty of a fine. Aldus was a typically productive scholar who used his knowledge for a very practical purpose and devoted himself quite regardless of the material rewards that might come to him to the diffusion of a great literature. One of our greatest printers of the modern time, Theodore Low DeVinnie, writing with manifest affectionate regard for Aldus in the old Scribner's magazine of October 1881, has a paragraph that is almost a filial expression of respect, coming evidently from a man who knows and appreciates very well his subject, in which the modern American has finely summed up what Aldus had accomplished for his profession. Coming from such a source the compliment carries all the more weight.

"Aldus' taste as editor went beyond the text. Not content with an accurate version, he had that version presented in pleasing types. Everybody admits the value of his invention of *Italic*, even if his use of it as a text letter be not approved. But few persons consider that we are indebted to Aldus for the present forms that he introduced. How great this obligation is will be readily acknowledged after an examination of the uncouth characters and the discordant styles of Greek copyists before the sixteenth century. Aldus' invention of small capitals has already been noticed. Here, then are three distinct styles of book-printing types which he introduced, and which have been adopted everywhere almost without dissent. Other printers have done work of high merit; other type-founders have made pleasing ornamental or fancy types; but no printer or founder since Aldus has

invented even one original style of printing types which has been adopted and kept in use as a text letter for books."

All during the Renaissance period it was felt all over the world that Italy was the eminently desirable *mecca* for scholars who wanted to get in touch with what was most advanced in the intellectual life and lay a sure foundation of scholarship. No department of the intellectual life was neglected. The Greek authors were issued in magnificent editions and of course the Latin authors were studied with the greatest care, the manuscript copies of their works sedulously collected and faithfully collated. Roman history was enlarged and humanized and illustrated by the study of poems, inscriptions and antiquities generally. Such names as those of Roberttelli, Segonio, Panvinio, Nizzoli and above all Muretus to use the more familiar Latin form of his name, are forever famous in the history of scholarship. The last named was a Frenchman, a most brilliant teacher and lecturer, a friend of the group of poets known as the Pleiades, a private tutor of Montaigne. Muretus began to lecture before he was twenty and before he was twenty-five was famous. When about thirty he found it impossible to live in France because of the civic dissensions and spent the remaining thirty years of his life in Italy. He was five years in Venice and published at the Aldine Press editions of Catullus, Horace and Terence, Tibullus and Propertius. The last twenty years of his life were spent in Rome where he lectured on Aristotle's Ethics, the *De Officiis* and the Letters of Cicero, and the Rhetoric and Politics of Aristotle. Most of his published works were really his lectures written out for a larger public. Muretus was probably the best imitator of Cicero's style that ever lived. Ruhnken declared that nature had given him the same genius as Cicero. He was, however, essentially a stylist, not a great thinker. More than once the Roman ecclesiastical authorities interfered with his lectures and forbade their continuation because Muretus lacked solidity and conservatism in philosophic, legal and social matters. He himself recognized certain unfortunate tendencies to extravagant expression

in these topics and continued his life at Rome with great satisfaction in spite of these interferences, drawing ever closer to the Church and eventually becoming a priest. Probably nothing illustrates better the relations of the Church to scholarship at this time than the fact that Muretus, like Linacre, toward the end of their careers both asked for and obtained the privilege of ordination as priests of the Church. Italian ecclesiastical discipline was for them so tempered by breadth of sympathy with scholarship that they learned to appreciate both.

While so good a Latinist, no one appreciated the value of Greek more than Muretus, and he did not hesitate to declare that "all that is lofty in thought is enshrined in the literature of Greece." He even added the declaration that "we can predict with confidence that if the men of our time shall begin to neglect Greek literature the degradation and even destruction of high thinking and artistic interests will surely be imminent." At the age of fifty Muretus became, as we have said, a priest and at his death some ten years later was buried with high honors near the main altar of the French Church of SS. Trinita de'Monti.

Muretus was followed as a lecturer at Rome by Francesco Patrizzi who was not only not interfered with in his lectures on Plato but who, as noted by Sandys in *A History of Classical Scholarship* (page 153) actually proceeded to attempt in his *Nuova Philosophia* (1591) the rather dangerous combination as it might seem of the opinions of Plato with the teaching of Bernardino Telesio (See chapter on Physical Science.) He dedicated his book with due permission to Pope Gregory XIV who had formerly been his fellow student at Padua. Pope Clement VIII invited Patrizzi to Rome where he was professor of Platonic Philosophy till his death in 1597.

About this same time among the antiquarians and archaeologists at Rome were such men as Fulvio, Orsini, Marliani, Ligorio, Panciroli. These men and others published descriptions of the ancient statues, the buildings and other ancient monuments and gathered a vast collection of Latin inscrip-

tions and made plates of the remains of old Rome with efforts at reconstruction of great use to subsequent scholars.

Italy has continued all down the centuries to be the abounding mother of the great productive scholars whose influence was felt all over the world of their own day and by succeeding generations ever since whenever they were scholarly inclined. Probably the most erudite historian of more modern times is Baronius whose *Annales Ecclesiastici* marked an epoch in the writing of history and obtained for its author the title, after Eusebius, of Father of Ecclesiastical History. The first volume of his Annals appeared in 1588 and immediately attracted wide attention. It had a phenomenal sale and was immediately translated into the principal European languages. He completed the twelfth volume which, according to tradition, he had foreseen in a vision would be the last of his works, in 1607. He became the head of the Oratorians after St. Philip Neri's death, was made a Cardinal in 1596 and would doubtless have been elected Pope, but having incurred the enmity of Philip II of Spain, his election to the Papacy was vetoed by the Spanish Cardinals. He was very highly esteemed and his reputation for critical scholarship has maintained itself all down the centuries. Writing at his period he necessarily made mistakes, accepted some documents as authentic that were not and failed in critical discrimination of materials, but he was a pioneer in genuine scientific history and his work brought about a real foundation of the science of history by which his own writings are now judged much more severely than would have otherwise been the case. He published many lesser works and these were all widely read.

One of the great scholars of Italy and one of the greatest of intellectual influences in Europe for a full century of the most disturbed time was the Jesuit, Bellarmine, usually known as Cardinal Bellarmine. He dominated the religious controversial world of the latter half of the sixteenth century. He was the most influential figure in the Church during the stormy period from 1550 to 1650. As a Cardinal he was

famous for his lavish charity to the poor and his utter devotion to his work. A whole immense library of volumes was issued in answer to his controversial works and a special lectureship against his writings founded at a Protestant University. It is indeed rather hard for most people to understand now, how universal was the attention of the intellectual world of Europe during his time to everything that came from his pen. We are no longer interested in religion enough to controvert about it, but in Bellarmine's time it was the subject closest to all hearts and as a consequence his writings were read by scholarly men all over Europe. Protestants as well as Catholics were interested everywhere. Bellarmine's works are his monument. Certain parts of them will never grow old. They have been the mine for many subsequent controvertialists and the storehouse for preachers and writers. The more they are known the more they are admired.

Prof. Sandys the distinguished English classical scholar of Cambridge, England, who in 1905 delivered the Harvard lectures on *The Revival of Learning* has necessarily much to say in the lectures as published* of Italian scholarship at this time. He tells the story of the academies of Italy in Florence, Venice, Naples and Rome, and how much they accomplished for true scholarship, and for the intellectual life and culture not only of Italy itself but for the world in general. He gives in some detail the various special objects of their interest. There were academies for the cultivation of Cicero, of Plato, of classic agriculture, of architecture, of country life and of the classical theatre and the presentation of classical plays. Foreign students and scholars who visited Italy at this time were particularly interested in the Italian academies. Erasmus was welcomed at Venice and at Florence by their academies. Linacre found himself at home, made so especially by the academicians and Milton on his visit to Italy was formally received by one of the Florentine academies and "recited from memory some of his

* Cambridge University Press, 1905.

ITALIAN SCHOLARSHIP

early Latin verses described in the minutes of the meeting as *molto erudite*, while his other compositions were received (as he tells us) 'with written encomiums which the Italian (as he observes) is not forward to bestow on men of this side the Alps.' "

Milton on his return from Italy felt that such an institution as he had found this academy to represent, would be admirable for the cultivation of the intellectual life of England. In his essays on *The Reason of Church Government* he dwelt on this and approves of the adaptation for England of such "festival pastimes as may civilize, adorn, and make discreet our minds by the learned and affable meeting of frequent academies." In spite of many reasons, religious and political, for lack of sympathy with the Italians, Milton found much to admire in the intellectual life of Italy. He was very proud of their recognition of his equality as a literary man, he recalled with pleasure his meeting with Galileo and in the rude England of his day, when scholarship was at such a low ebb, he seems sometimes to have regretted the happier scholarly environment of Italy.

Some of these academies in Italy were rather short lived. That might possibly be expected from the rather trivial names given certain of them. One of them, for instance, at Naples, was called simply "The Idlers." In Florence four of these academies bore the fanciful names of "The Insipid," "The Shy," "The Disheartened," and "The Stunned." Evidently studious youth delighted as much in the bizarre in the matter of titles and above all in whatever gave a flavor of mystery, as in our own time and country. In Bologna there was a second academy of "The Idlers," *Degli Oziosi*, or as we would say perhaps, "The Strollers." Curiously enough some of these trivially named academies were suppressed by the Italian governments. The reasons for suppression are not always absolutely known, but it would seem that in some places they were used as a cloak for political meetings, and in others their proceedings degenerated into immorality. Some of them were scarcely more than the reading clubs and study circles

which exist in many cities now, and which so often bear some cryptic name adopted in order to avoid the air of pedantry associated with more serious designations. All record of a great many of these academies has doubtless perished, for it became the custom during the Renaissance period particularly to organize associations that were partly social, partly literary and were merely meant to afford amusing relaxation from the more serious business of life. Prototypes of all our modern associations for art, letters, and even the more trivial culture interests of all kinds are to be found in Italy.

In spite of the apparent triviality and temporary significance of many of these academies, some of them lasted for a good many years. The *Accademia della Crusca* founded in the sixteenth century at Florence, the Academy of Bran as it was called, whose place of meeting bore the semblance of a flour mill and a bakehouse, a symbol of the occupation of the academy with the sifting of the Italian language, is still in existence. It was founded as a protest against the exclusive study and imitation of the Italian poems of Petrarch, and in order to create a standard of usage for all Italy. Its dictionary has made it famous and is at the same time a monument to the scholarship of the men who created it. The Roman Academy of the Lincei or Lynxes devoted to philosophy and science, founded about 1600 and counting Galileo among its earliest members, has been revived and still flourishes. That other Florentine Academy, known as the *Colombaria*, from the turret room, resembling a dovecote, in which it met, continues after two centuries still to produce papers on Italian history. How much of productive scholarship and culture the world owes to these academies, only those who are familiar with the details of the history of them can properly appreciate. Writers who have studied their histories are enthusiastic with regard to the stimulus they afforded members, and the sincerest flattery is the imitation which has been accorded to them by the development of corresponding academies in all the countries of the world since the Renaissance.

The Italians placed the world of scholarship profoundly in their debt by their work in lexicography, above all in Latin. The first great modern Latin lexicographer was Ambrogio da Calepino better known as Calepinus from whose name a term for dictionary was made and in tribute to whose work the French have made a new word, *calepin*, a note book or commonplace book. Calepinus' dictionary published first in 1502, and corrected in an edition published in 1521 marked a great advance on the medieval glossaries and on the various vocabularies of the last quarter of the fifteenth century (Sandys.) For many years Calepinus' work formed the basis of dictionaries of many kinds published in various countries, which in their origin usually began as revisions of Calepinus. When Calepinus' work was finally replaced it was by Facciolati and Forcellini which has continued with revisions to be the principal Latin lexicon of scholars down to the present time. For this Forcellini was mainly responsible, and by forty years of patient work he raised a lasting monument of gigantic industry and magnificent exhaustive scholarship.

Italian scholarship never made, at least the great mass among the Italians, mere bookmen, or admirers of the past to the oblivion of the present. Indeed, it may be said that perhaps in nothing are the Italians more wonderful than in their fine faculty for critical appreciation of others' work, not only in the past but in their own time. Michelangelo's appreciation of the sculpture of the Greeks is well known. It was he who when called to see, immediately after they were excavated, the famous sculptured horses that are now on the Capitoline Hill in Rome, after admiring them from every standpoint finally stepped up to one of them and said in Italian "*camina*" (in familiar English "get up,") as if the horse seemed so lifelike to him that it ought to walk off at his word of command. Could there have been a higher tribute paid to the old time sculptor than this.

There is scarcely one of the great Italian artists of the greatest period of art of whom some similar story is not told.

WHAT CIVILIZATION OWES TO ITALY

The great founder of modern art, that is, the man who united the two streams of artistic influence, that of Gothic art from the Middle Ages, and that of ancient art as it was being unearthed in the early Renaissance time, was Masaccio. We are now quite sure about his high place in art, but Leonardo da Vinci was so assured of it in the generation immediately after Masaccio's death, that we have from him one of the highest of compliments. Masaccio died at the early age of twenty-seven, and it might seem to have been rather easy for a great painter like Leonardo to have missed the significance of his work. This, however, is what he said of him: "After Giotto the art of painting declined again, because everyone imitated the pictures already done. Thus it went on until Tomasso of Florence, surnamed Masaccio, showed by his perfect works how those who take for their standard anyone but Nature — the mistress of all masters — wear themselves in vain." Leonardo summed up a great career in a fine appreciation for the artist and a critical maxim for all time.

Leon Battista Alberti, himself one of the greatest of architects, but a great scholar and a man of profound erudition in all that relates to classical antiquity, might almost be excused if he had his judgment somewhat warped in favor of the past and prove therefore to have neglected, or at least not have properly appreciated his contemporaries. It is from him, however, that we have the well known expressions, when surprised on his return from exile at the magnificent strides in art that were being made in his native city Florence, he said to Brunelleschi: "I have been accustomed both to wonder and to grieve that so many divine arts and sciences which we see to have abounded in those most highly endowed ancients were now lacking or utterly lost. . . But since I have been restored to this our native land which surpasses all others in her adornment, I have recognized in many, but chiefly in thee, Philip (Brunelleschi) and in our near friend Donato, (Donatello) and Luca della Robbia and Masaccio, genius capable of every praiseworthy work, not inferior to that of any ancient and famous master in the arts." Has there ever



LEONARDO DA VINCI, MADONNA OF THE ROCKS (LONDON)

been contemporary appreciation that proved to be the judgment of the after ages as this!

The charming courtesy of this letter and yet the terms of intimate familiarity and the thorough appreciation of the true greatness of his friends is typical of the Italian character in many ways. Not only did they do this for their own compatriots, but over and over again the painters from foreign countries were welcomed, given opportunity to express themselves, and their genius finely appreciated. Hence the fine influence that Italy exerted on the art of other countries; of which our histories of art are full, but what is not so well known is that in every department of the cultural life the same thing was true.

In science Vesalius found his best opportunity for study in Italy. He went to Padua when he was twenty-one, having failed to obtain the opportunities for study that he desired at either Paris or Louvain, in his time the two great universities of the West of Europe. They made him a professor at Padua when he was twenty-seven. He did his work in Italy for some twenty years and there was not a sign of Chauvinism about their treatment of him. Later Steno the Dane, lacking opportunities in Holland and finding a jealous master who hampered his work in Paris, went down to Italy and accomplished there the great work in anatomy which meant so much for the development of anatomical science, and for which he was so deservedly chosen the professor of anatomy at Copenhagen, in his native country.

While the scholarship of France in the later Renaissance period is sometimes said to have seriously rivalled the prestige of Italian scholarship before the end of the sixteenth century, it must not be forgotten that the first great teacher of the French in the New Learning was Jerome Aleander, an Italian who arrived in France shortly after the beginning of the sixteenth century with an introduction from Erasmus. He became Rector of the University of Paris in 1512, but resigned this position to become Librarian of the Vatican at Rome in 1517, where his distinguished services, learning and devotion

to Christian scholarship brought him a Cardinal's hat. It was under his direction that the first Greek printing in France was done. In 1509 he issued an edition of Plutarch's treatises on morals to serve as textbooks for his pupils.

The first of great native French scholars of this time was Budaeus (Budé) who went on diplomatic missions to Popes Julius II, and Leo X, and drew deep inspiration and incentive from contact with the learned Italians of that time. His influence with Francis I and Margaret of Navarre, the king's sister, meant much more than any other single factor for the foundation of the College of France.

Nearly everywhere the influence of Italian scholarship on French can be traced very clearly. The Scaligers who conferred so much prestige on French scholarship in the sixteenth century were of Italian origin, the elder born in Italy and securing his education there. Even Rabelais, whom the world has come to recognize now as having done so much for scholarship and education at this time, was more deeply influenced by visits to Italy and by his Italian masters than by any other elements in his environment.

In the Spanish Renaissance the influence of Italy can be traced even more directly and more fully than in France. There was a magnificent development of scholarship which began shortly after the discovery of America, due to men who had studied in Italy and returned with copies of the classics, and with the spirit of the New Learning so profoundly in possession of them that their initiative roused many others to active study of the humanities. The earliest of these Spanish scholars was Guzman, a nobleman who visited Italy during the Council of Florence, and returned with copies of Cicero and Quintilian. Antonio of Lebrixa, after spending twenty years in Italy, returned about 1473 to lecture at all the Spanish Universities, and to publish grammars of Latin and Greek as well as Hebrew. After this, grammar became the specialty of the Spaniards, suiting their philosophic temper of mind, and they wrote the grammars for Europe. Barbosa, a pupil of Politian, taught Greek at

Salamanca and many Spanish Bishops who went on official visits to the Pope came back with manuscripts, and above all with deep interest in classical studies to scatter the seeds of the New Learning everywhere. Very few of the distinguished Spanish scholars of this time failed to be influenced either directly by visits to Italy or by Italian teaching.

Portugal received its first impetus to scholarship at this period from Italy and Resende taught Greek at Lisbon, and Evora after an education in Italy. Achilles Statius, perhaps the most famous of Portuguese scholars, won his high reputation in Rome by a work on ancient portraits, and by commentaries on the *Ars Poetica* of Horace when he was not yet thirty, and added greatly to his reputation by his scholarly editions of Catullus and Tibullus. The University of Coimbra, which became famous about that time for its scholarship and attracted students from many parts of Europe, owed most of its incentive to good work in the humanities to Italian sources, and the Jesuits who shed such prestige on it were greatly influenced from their central house, the *Collegio Romano* in Italy.

England like all the other countries of Europe owed much to Italy for stimulation to scholarship at this time. Practically all the distinguished Renaissance scholars of England studied in Italy. The first English Humanist was Lord Grey of Codnor, who having gone to Cologne, famous for its general culture and education at this time, made so many friends there, that when he came to the conclusion that he must go to Italy because he felt sure that he could secure better opportunities for classical culture down in the Peninsula, he had to steal away from his German friends at night. He ordered a library in Florence, studied at Padua, was attracted to Ferrara by the reputation of Guarino and from there went to Rome, where the scholarly Pope Nicholas V, wishing to have all the weight of his influence in England exerted to the best advantage for classical studies and the development of scholarship, nominated him Bishop of Ely. Dr. John Free, a physican whose expenses during his Italian trip were

WHAT CIVILIZATION OWES TO ITALY

paid by Lord Grey, attracted so much attention from Italian scholars that he came to be recognized as their peer in every way, was appointed Bishop of Bath with the same idea of fostering education, but unfortunately he died before consecration.

The most interesting feature of Italy's welcome for these students from Britain "which is situated outside the world," was as we have already emphasized with regard to students of other nationalities, the absolute lack of any narrow national jealousy so far as regards their academic careers and opportunities. It was not unusual to have them appointed to important posts in the university in competition with the Italians. We pride ourselves on our internationalism, but where will it be exemplified as in the Italy of the Renaissance. Reynold Chicheley, who studied at Ferrara under Guarino, became Rector of the university there. John Tiptoft, Earl of Worcester, was honored everywhere in the course of his student pilgrimages to Italy, and was heard in a Latin oration by Pope Pius II (Aeneas Sylvius) who is said to have wept tears of joy because of the feeling of satisfaction that classical scholarship was now a world possession, having crossed the Channel to Ultima Thule. The first Englishman who studied Greek in the Revival of Learning was William Selling, a Benedictine monk, who had his interest aroused while on an embassy to the Pope. He was the uncle of Linacre, who had the privilege of accompanying him on this embassy. Grocyn and Bishop Fisher and Dean Colet were all influenced directly or indirectly very deeply by the Italian scholarship of this time.

During the seventeenth century the palm for scholarship in Europe was to pass to the Hollanders in connection with the University of Leyden, and yet the names of such men as Raphael Fabretti of Urbino, who became director of the Archives of Rome and Father Strada, S. J., whose *Profusiones* are still of interest to scholars and the great mass of Latin verse which seemed so important in its own time, but has become so almost utterly insignificant in ours, shows the

Italian devotion to the intellectual life. There are devoted scholars of that seventeenth century Latin literature of the Italian peninsula who feel sure that it is destined to have a revival in a generation that shall have more mental interests than we have. Certainly it is a standing monument of the scholarly interests of the Italians of that time.

In the eighteenth century, as we have said, Italy gave the world that magnificent aid to scholarship, Forcellini's surpassing Latin lexicon. This is one of the epoch making works of Latin scholarship. Corsini's *Fasti Attici* laid the foundation for a chronology of the history of Athens and opened up the path to the solution of most of the problems of Hellenic chronology. It was during this century, too, that Piranesi did his wonderful work in the bold and vigorous engravings of the Roman monuments of Italy, which are still so famous and continue to interest the world. Was ever a report of a commission so marvelous in its completeness as his? No work equal to this has ever been done by a single man and it has a profound significance not only in art, but in scholarship and history.

Another of the great world scholars whom the world owes to Italy at this time was Lodovico Antonio Muratori, whose works form almost a library by themselves. His monumental work *Rerum Italicarum Scriptores ab Anno Erae Christianae 400 ad Annum 1500* contains the sources of Italian history as never before collected. With the assistance of the *Societa Palatina* of Milan it was published in twenty-eight folio volumes. Modern appreciation of its value can be gathered from the fact that a new critical edition of it was in course of appearance in Italy before the war. It was looked upon as one of the most important works of this generation. This is however, only a single one of Muratori's works. He has six volumes of essays on many subjects connected with Italy entitled *Antiquitates Italicae medii aevi*. In the third volume of this collection what is known as the Muratorian canon, the oldest known list of books of the new testament which was discovered by Muratori is published. The manuscript

WHAT CIVILIZATION OWES TO ITALY

containing the canon originally belonged to the ancient monastery of Bobbio and is now at Milan. It is of the highest importance for biblical exegesis. Altogether Muratori's works fill seventeen volumes quarto in the original edition or eighteen volumes in the edition of the nineteenth century. In spite of adhering to certain political doctrines unfavorable to the Papacy, and holding certain religious ideas in which he was in disagreement with a large number of the theologians of his time, Muratori was highly respected by churchmen, and received most encouraging letters from Pope Benedict XIV. and from Cardinal Ganganelli, who was afterwards Pope Clement XIV. Muratori is one of the universal geniuses of wide scholarship and profundity of intellect, at home in all fields of knowledge, who furnish incontrovertible evidence of the breadth and depth of the Italian intellect at its best.

One of the great Italian scholars of this eighteenth century whose work has deeply influenced the erudition of the world is the Jesuit Tiraboschi, whose career fell in the latter half of the century. He became the librarian of the Duke of Modena, enriching the library with many books and manuscripts and providing it with catalogues. He wrote a history of Italian literature which is very well known. It is extremely valuable because of the abundance of precious documents with which it is illustrated. Besides he wrote a series of other historical papers of less importance, and yet all of them of value because of the immense erudition which he had at his command, and the breadth and depth of his scholarship.

Italian scholarship even in the nineteenth century, in spite of the political disturbances and unfavorable conditions made some magnificent contributions to world culture. The learned Jesuit Angelo Mai in the first part of the nineteenth century did much original work of great value. No recent scholar has had the good fortune, due in Mai's case to intense devotion to his work, to add so much to the classical treasures of the world as this Italian member of the great teaching order.

Sandys in his *History of Classical Scholarship* furnishes a brief catalogue of his works:—

“As Librarian in Milan (1811-9), he published, from Mss. formerly at Bobbio, fragments of six speeches of Cicero, the correspondence of M. Aurelius and Fronto, portions of eight speeches by Symmachus, fragments of the *Vindularia* of Plautus, as well as scholia and pictorial illustrations from the Ambrosian Mss. of Terence (1814-5). His publications from Greek Mss. included a large addition to the Speech of Isaeus *De Hereditate Cleonymi*, a hitherto unknown portion of the *Roman Antiquities* of Dionysius of Halicarnassus (1816), as well as *scholia* on the *Odyssey* (1819); he also took part in an edition of the newly discovered Armenian version of the Eusebian chronicle (1818). In Rome he published from a Vatican palimpsest large portions of Cicero’s lost treatise *De Republica* (1822) collected the remains of the pre-Justinian Civil Law (1823), and summed up his wonderful work as an editor of hitherto unknown texts by producing from the Mss. of the Vatican three great series, of ten volumes each, the *Scriptorum veterum nova collectio* (1825-38), *Classici auctores* (1828-38) and the *Spicilegium Romanum* (1839-44). After an interval of eight years the *Spicilegium* was followed by the *Patrum nova collectio* of the last two years of his life. (1852-4).”

Other distinguished Italian scholars of the last century whose productive erudition is well known were Amadeo Paron who did so much for Cicero’s text, though also for Empedocles and Parmenides; Masso Vallauri, who wrote a critical history of Latin literature and edited a large number of school texts of Latin classics; Domenico Pezzi who wrote *La Lingua Graeca Antica* looked upon as very valuable; Ascoli who accomplished so much in comparative philology and whose lectures on comparative phonology have been translated into several European languages, while his edition of the *Codice Irlandese* of the Ambrosian Library made in 1878 was a distinguished contribution very early in its history to the modern Celtic movement and the revival of the study of

WHAT CIVILIZATION OWES TO ITALY

Gaelic. Rosmini's companions and disciples made some fine contributions to Italian scholarship. Perhaps the best known is De-Vit, who became a member of the Institute of Charity founded by Rosmini, and in the leisure thus afforded for his studies made an enlarged and revised edition of Forcellini and wrote lexicographical articles on Latin inscriptions and various historical associations of the Lago Maggiore and the valley of the Ossola.

Italy has of course been the great home of the illuminating studies in inscriptions and coins, which have meant so much for the history of Rome and for the better understanding of classical literature. The studies in these subjects during the nineteenth century have been particularly assiduous and successful and classical archaeology has been pursued by many in Italy with ever increasing success. Luigi Canina Bartholomeo Borghesi, who as citizen and podesta of the still independent republic of San Marino, produced two volumes on the new fragments of the *Fasti Consulares* and many other valuable studies is a typical instance. His collected works fill nine volumes. The *Corpus Inscriptionum Latinarum* owed much to him and practically all to Italians. The Jesuit Raffaele Garrucci did his early work down at Naples, where he published the first edition of his *Graffiti di Pompei* and then was for thirty years in Rome where he prepared a *sylloge* of inscriptions of the Roman Republic and a great work on the coins of ancient Italy. Other names such as Cavedoni, Competetti, Abellino, Fabretti, the Duke of Ser-radialeo and Cavalari as well as Fiorelli and Bruzza well deserve to be mentioned, and would of themselves have conferred distinction on the scholarship of any other country.

Italian scholars in the nineteenth century have been particularly successful in the great work of re-creating early Christian times from the monuments. De Rossi, famous for his work in many branches of archaeology and especially successful in Latin epigraphy, did much for the study of Roman topography and especially the elucidation of the Regions and City and Roman inscriptions generally. His magnificent de-

tailed research by which he brought about the identification of the cemetery of San Callista, will ever remain a triumph of genius scholarship. To use Sandys' expression:

"He is justly regarded as the founder of the recent study of Christian Archaeology in Rome, but De Rossi himself had a special reverence for the memory of 'the true Columbus' of the Catacombs, Antonio Bosio (1575-1629), the learned and industrious author of a far earlier *Roma Sotteranea* (1632)."

Scarcely less famous than De Rossi was Bruzza, whose complete corrections of the Roman inscriptions of Vercelli won the highest praise from Mommsen, while the grateful citizens of Vercelli called their local museum by the name of Bruzza and struck a gold medal in his honor. He was President of the Roman Society for the Preservation of Christian Archaeology and met his death while superintending the excavation of the crypt of St. Hippolytus.

The Italians have published many books, contributed to the *Corpus Inscriptionum Latinarum*, published bulletins and periodicals of many different kinds with regard to archaeology, classical scholarship, grammar and classical studies of all sorts. What they have done for a better understanding of Roman history by their excavations in the forum alone shows how they are continuing finely the old time tradition of Italian scholarship. Sandys says:

Since the end of 1898 the excavations in the Roman Forum have comprised the discovery of the site of the 'Lacus Curtius' the base of the colossal statue of Domitian described in the *Silvae* of Statius, the pavement on which the body of Caesar was burnt, the legendary tomb of Romulus, and the earliest of all Latin inscriptions."

One of the wonders of the world, as he has been well called, whose career shows at its highest the power of the human mind to accumulate knowledge and use it practically, was the Italian Cardinal Mezzofanti, "the greatest of polyglots," who died in 1849. He had a prodigious memory and at the end of his life spoke perfectly thirty-eight languages, some thirty others less perfectly and knew from practical

WHAT CIVILIZATION OWES TO ITALY

use fifty dialects. From his very earliest years his memory had been remarkable, and he completed his three years course of philosophy at the age of twelve with a public disputation. He had completed his theological studies long before he could be ordained, and in the interval of waiting he devoted himself to languages. When he was about twenty-five, after the Napoleonic battles of 1799 and 1800, he was chaplain to the hospitals of Bologna, which were crowded with the wounded and sick soldiers of almost all the nationalities in Europe. Here Mezzofanti devoted himself to affording consolation to all of them whatever their languages. He thus perfected his own knowledge, added new languages to his repertoire, yet devoted himself so unstintedly to the care of the poor fellows into whose life he brought so much consolation that he was looked up to as a marvel of charity. This set the seal upon his life-work and he became the confessor of foreigners. He was invited to Rome to place his learning directly at the service of the Holy See, he became custodian-in-chief of the Vatican Library, and Consultor of the Congregation for the Correction of the Liturgical books of Oriental Rites, of which he became the Prefect. He is one of the few marvels of precocity in history, famous in early youth for their knowledge who have lived out a long life, (he was past seventy-five years of age when he died) and fulfilled the promise of their early years.

As a marvel of erudition Mezzofanti may well close the chapter on Italian Scholarship. The brief summary requiring so much condensation that it could be made scarcely more than a catalogue of learned authors and their works certainly affords abundant evidence that the people of the Italian peninsula have had more profound scholars among them than any other country. Their influence has been felt in every country where the higher education has flourished, and it is no wonder that all down the centuries ambitious students of the humanities have looked longingly to Italy, and many of them have found their way down to the peninsula. Italian scholars almost without exception have not been merely ac-

ITALIAN SCHOLARSHIP

cumulators of erudition, but productive workers in the field of scholarship, nearly always leaving behind them as a special heritage of mankind, works that rendered the paths to scholarship much easier for succeeding generations.

PHILOSOPHY

PHILOSOPHY, as the science of the meaning of life and the origin and destiny of man and of the universe, took its primal rise in Greece, and the impress of Greek thinking has always remained on it. There is to all practical purposes no mode of philosophic speculation that was not anticipated in Greece long ago. Idealism, realism, atomism, dynamism, matter and form, evolution, all the philosophic 'isms' are readily traceable to Greece. We may not quite agree with the suggestion of Sir Henry Maine and Gladstone that "whatever lives and moves in the intellectual order is Greek in origin," but there can be no doubt that Greek thought occupied by far the most important portion of the history of philosophy. Indeed there are many phases of Greek philosophy which over and over again have seemed to be mere idle speculation to many generations, yet to others have appealed as perhaps the nearest approach to truth that man is likely to attain.

Immediately after Greece in the history of philosophy, however, and with its practical genius developing and passing on the message of Greek philosophy for the modern world comes Italy and the Italians. In the classical period the Romans made no supreme contributions to philosophy, though they accomplished work in the practical philosophy of life, and left some writing on ethics that men will never willingly let die. The world of literature and of thought would indeed be very much poorer if it did not possess such works as those of Cicero on "Immortality" or his interesting contribution to applied ethics in *De Officiis*, *The Duties of Life*, or the philosophic essays on *Friendship* and *On Old Age* with their distinctly modern flavor which created a new type of

literature and have proved models and hints for so many essays in the after time. So great a mind as that of St. Augustine was deeply influenced by Cicero's *Hortensius* from which he declared that he imbibed a love of the wisdom that true philosophy of life which Cicero so eloquently praised. Augustine had been a rhetorician up to this, but now his heart became devoted to philosophy.

The history of literature and philosophic thought would suffer a sad gap without Lucretius, and the after time would be the poorer indeed for failing to know how modern and thoroughly up-to-date a poet of the century just before Christ could be in his philosophic speculations on the origin and destiny of life, and on the question of evolution. The surprise is how much the Roman poet anticipated many phases of thought usually supposed to be very recent in origin. The Plinys are less seriously philosophical and yet they deserve a place in the history of philosophy, while one of the greatest of philosophical historians of all time is undoubtedly Tacitus. All this we owe to natives of the Italian peninsula in the older time that we often scarcely think of as Italian, though it is.

With the beginning of the Middle Ages Italy assumed a distinct leadership in the world of thought. The Romans had been scarcely more than imitators, marvelous copyists it is true, with a power and lucidity of expression all their own, but with the coming of Christianity, Latin philosophy in the Italian peninsula assumed a newer and deeper significance and a great original current of thought was initiated. Boethius "the last of the Romans," as he has been styled, but recognized by history as a Christian martyr who just about the end of the first quarter of the sixth century was put to death for his faith, wrote his *De Consolatione Philosophiae* while in prison preparing for his execution. While his book is strictly classical in character without any mention of Christianity, Boethius also wrote a series of Christian theological works, some of them mentioned by Cassiodorus. This testimony of a contemporary puts aside all

thought of the lack of authenticity of these works which used to be questioned. *Boethius' Consolations of Philosophy* "is by far the most interesting example of prison literature the world has ever seen." It was a chosen subject of study for ten centuries and the important poets and literateurs of Europe were devoted to it. It was a favorite book with statesmen and historians as well as philosophers and theologians. It has a glorious history in its translators and commentators. It was translated into Anglo-Saxon by King Alfred and into old German by Notker, the German. Its influence may be traced very clearly in Dante's *Convito* and references to it are frequent in the *Divine Comedy*. Its enduring vitality and its appeal to a world audience may be appreciated from the fact that its influence is quite as noticeable in Beowulf as in Chaucer. In Anglo-Norman and Provençal popular medieval poetry allusions to it are constantly to be found. It will thus be seen that few books have ever made so deep an impression on the greatest thinkers of so many generations as *Boethius' Consolations*.

A contemporary of Boethius, whose long life of ninety-three years was divided between statesmanship and contributions to philosophy was Cassiodorus. When about fifty years of age he retired to a monastery founded by himself, and devoted his life to harmonizing the culture of the ancient with that of the modern world. As a pioneer in this, modern civilization owes more to him than perhaps to any other single individual, of the early Middle Ages. He was the first great philosophic Christian educator. In his *Institutiones divinarum et saecularium litterarum* he outlines a broad liberal education in direct connection with the study of the Holy Scriptures. He encouraged research, dwelt on science as well as philosophy and insisted on the necessity of good libraries for consultation, thus helping in the establishment of the tradition of large monastic collections of books.

Among the great philosophic writers who have deeply influenced human thinking for some fifteen centuries are the

four great Latin Doctors of the Church, Ambrose, Jerome, Augustine and Gregory. All of these must be looked upon as Italians, for though Augustine was born in Africa he came of strictly Latin stock that had not been many generations out of the peninsula. These four men have more influenced the course of Christian thought ever since than any others. Ambrose was a characteristically practical Roman in whom the ethico-practical note is always dominant. His homilies are evidences of his gifts as a profound philosophic orator touched with poetic inspiration, who set forth the great message of Christianity in practical terms for all time.

Philip Schaff in his *History of the Christian Church* writing of Augustine nearly fifteen centuries after his time says that "He was a philosophical and theological genius of the first order, dominating like a pyramid antiquity and succeeding ages. Compared with the great philosophers of past centuries and modern times he is the equal of them all; among theologians he is undeniably the first, and such has been his influence that none of the Fathers, scholastics or reformers has surpassed him." Most of the historic theological controversies in the Church since St. Augustine's time have been founded on differences of opinion with regard to his meaning. The opposing scholars almost invariably asserted their claims to teach by his authority. He discussed very fully the most difficult questions of man's relation to the Creator and particularly grace and free will, and he is appealed to as the authority by practically all theological and philosophical teachers of these subjects ever since. His works have been issued in an almost endless number of editions and they have always been a favorite subject of study at every period since his death by all those deeply interested in the thought underlying Christianity. His work *The City of God* is the first great philosophy of history ever written, and contains an immense amount of philosophical thinking that has deeply influenced all succeeding generations. His *Confessions* show his power of looking within

himself, a quality of mind often thought reserved for our time, and he made of it a book that has meant very much for the practical philosophy of life ever since, probably never more so than for our generation when many editions of it have been issued. With Plato, Augustine has probably influenced the thinking of the scholars of humanity, the chosen minds of mankind, more than any other who ever lived, and there is good reason to think that the Latin Father of the Church has meant more for men in his strictly philosophic influence than even the Greek Father of Philosophy. It would be easy to gather eulogies of him which place him among the half a dozen greatest intellectual geniuses who have ever lived.

Nearly every Christian thinker of significance appealed to St. Augustine, or at least thought that he founded his theological speculations on Augustine's writings. Even Albert the Great and St. Thomas in the thirteenth century were condemned at times by various ecclesiastical authorities and even Church assemblages because they were thought to contradict St. Augustine. As a matter of fact, probably no writers on theology have ever had a higher opinion of Augustine than they. Above all in most of St. Thomas Aquinas' great Summa, his one idea seemed to be to incorporate into theology to as great an extent as possible St. Augustine's thoughts. In the fifteenth century Bessarion and Marsilio Ficino used Augustine's name for the purpose of enthroning Plato in the Church and excluding Aristotle. It is rather easy to find the basic ideas of Cartesianism in some of St. Augustine's philosophic speculations and Descartes undoubtedly thought that he was drawing his inspiration from the great Latin Father of the Church. Descartes, it may be recalled, has been looked upon as the most important of modern philosophers whose influence was most deeply felt in the eighteenth and nineteenth centuries. Malebranche and Rosmini and our own Brownson ascribed their ontology to St. Augustine, or at least used his authority to support it. Augustine has been the favorite master of

nearly every Christian thinker since his time. The faithful and heretics have both claimed his support. Jansenius founded his system of religious thought Jansenism, presumably on Augustine. Helvetius supported similar doctrines in what he claimed were commentaries on St. Augustine.

St. Jerome the third of the Latin Fathers of the Church is a much less important contributor to theology and ecclesiastical philosophy than Augustine, though he has a distinguished place in the history of religious controversy. It was rather as a literary worker than as an original thinker that his influence was to be felt. His great translation of the Bible has done more than anything else to establish a standard scriptural text, and his principle of exegesis that "it is usual for the sacred historian to conform himself to the generally accepted opinion of the masses in his time" has remained as a basic maxim of biblical criticism meaning more for the explanation of the difficulties of the text than any other. His controversial works, especially against Jovinian and Rufinus and Vigilantius are storehouses of the thought of his time which has become fundamental in Christianity, and his commentaries on the Scriptures are in the present day of even greater significance than they have been during much of the intervening period. When it is recalled that his controversial works concern such questions as the relative value of faith and good works for salvation, the perpetual virginity of the Blessed Virgin and the principles of asceticism, it will be seen that far from representing ideas that have lost their significance in the course of time, he has touched on the problems that are almost of the greatest interest at the present time.

When the middle ages were beginning their ascent into modern times, there came a great philosophic thinker and writer who was destined to influence the scholars and students of Western Europe as deeply almost as the Fathers and Doctors of the Church. This was Anselm, the great Archbishop of Canterbury, who had been the abbot of the

famous monastery of Bec in Normandy as successor of Lanfranc and afterwards succeeded him in the English primacy. Anselm was born at Aosta and though usually thought of as English because of his occupation of the See of Canterbury, he was thus a native of the province of Turin and his birth place, the Roman *Augusta Pretoria* had been a Roman colony since Augustus' time. Its great Cathedral of the eleventh century shows how thoroughly Italian it had become. His father was a Lombard, but the family had been for many centuries in Italy and were of the same stock as most of the enterprising North Italians of our day. Anselm is usually considered as the father of scholasticism as applied to theology, and as this has proved the absorbing study of most of the theologians since, it is easy to understand how profound Anselm's influence must be recognized to have been.

His works are the *Monologium*, the *Proslogium*, the *Cur Deus Homo* and various homiletic and meditative writings. The *Proslogium* is famous as containing Anselm's chief achievement in philosophy, the ontological argument for the existence of God. This has been the subject of much discussion and contradiction, and yet many thinkers have come back to it time and time again ever since it was written. His *Cur Deus Homo* has been the basic teaching in what concerns the doctrine of the atonement, that is why God became man, ever since it was written. It has been a favorite volume for many who were not so much interested in its philosophy and theology as in its literary philosophic quality and its charming exposition of this great problem that lies at the basis of Christianity. It has been issued in all manner of editions ever since, and few scholarly Churchmen of any denomination are willing to confess utter ignorance of Anselm's wonderful little book. Answering those who criticize the Middle Ages for lack of attention to form and style in their writings and "who will not pardon literature whatever its historic and educative importance may be, for being something less than masterly in itself," Prof. Saintsbury

of the University of Edinburgh declared that they "will find it difficult to maintain the exclusion of the *Cur Deus Homo* or the *Dies Irae*" from the list of great literature. Even in the form of presentation and style these are great works.

Hegel the German philosopher was one of those who was deeply influenced by Anselm. To him the ontological proof of the existence of God had a special appeal. The same thing was true of Descartes. Between these Kant assailed it, but in doing so paid his tribute to the philosopher of nearly eight centuries before. While the argument was rejected by St. Thomas Aquinas, it was accepted enthusiastically by Alexander of Hales and ardently supported by Duns Scotus, men who are deservedly looked upon as among the greatest thinkers of that period, the end of the thirteenth and the beginning of the fourteenth century. More than five hundred years later the ontological argument proved supremely fascinating to such profound philosophic minds as Rosmini and our own Orestes Brownson, as well as to a large number of distinguished teachers of philosophy and theology. Thus to have influenced men of deep thinking powers for many generations, men of such different forms and modes of culture for nearly ten centuries, is the highest possible tribute to the quality of Anselm's philosophic genius. He was not at all, however, a mere writer of books and discussor of theories indulging in philosophic speculation. As the Archbishop of Canterbury he is one of the greatest of English churchmen. Freeman declared that "stranger as he was he has won his place among the noblest worthies of our Island" and he has further words of lofty praise for Anselm's charming character of gentle saintliness, yet immovable determination whenever the right was concerned. Carlyle, not easy to please declared him "One of the purest minded men of genius" and Frederick Dennison Maurice said of him "For Anselm was a philosopher, the philosopher of the eleventh century.

Anselm's predecessor at Canterbury as well as Bec, Lanfranc, is another of the great Italian thinkers of that time

who clarified ideas and especially worked out some of the most profound theological principles and their relations to reason. He was another example of these great Italian scholars of the Middle Ages who exerted deep influence in the West and proved to have great administrative powers as well as high intellectual ability. From his name he is often thought French, but like his namesake the great surgeon of the thirteenth century, he was an Italian born at Pavia and his family name was Lanfranchi. After Anselm the next great basic contributor to scholasticism was Peter Lombard, so-called from his birthplace in Lombardy, the "master of the sentences" or simply "the master" as he was known, whose *Book of Sentences* was written about the middle of the twelfth century. This work first printed in 1472 has been often reprinted since, the last time in 1892 (Paris.) Peter Lombard has continued to be a great living force in thought, and though his writings have often been attacked they have continued to be a basic element in Christian philosophy. He was the first successful follower of a *via media* on which one could safely walk between the encroaching claims of reason and dogma. Down to the sixteenth century the Book of Sentences was the university textbook upon which each future doctor of philosophy had to lecture during two years.

The greatest of the philosophers of Italy in the opinion of the majority of scholarly men in nearly every generation since his time, the greatest thinker since Aristotle and Aristotle's most profound expounder, was Thommasso d'Aquino, usually known as Thomas Aquinas or simply Aquinas, and called by English speaking Catholics, St. Thomas of Aquin. In the midst of the early Renaissance, when Greek influence was beginning to make itself deeply felt in Italy, St. Thomas took Aristotle in the standard edition of his works that had at last become available and adopted and adapted his principles to Christian theology. He did this so successfully that he has been hailed ever since as a Doctor of the Church and has been recognized as the ultimate authority in practically all questions of theology with regard to which the

profound use of the human reason is required. His own generation were ardent in their appreciation of him and Dante's adoption of Aquinas' teaching as the basis of his sublime poetry is the striking demonstration of the place Aquinas had come to hold. With the decadence of interest in deeper problems that came in the eighteenth century Aquinas lost something of his prestige only to have it all restored to him, just as happened to Dante, in our own day.

With the fondness of the Middle Ages for descriptive designations of favorite professors, Aquinas was given, because of the depth of his speculations on theological subjects the title of the Angelic Doctor, with the innuendo that he had the penetrating mental qualities of the heavenly intellectual powers. The greatest pope of the nineteenth century, Leo XIII, whom the intellectual world of his time not only within but without the Church considered one of the wisest minds of our time, decreed that St. Thomas' writings should be the standard in the teaching of philosophy and theology in all the Catholic institutions of learning throughout the world. If anything were needed to show his enduring influence surely this decision of a great modern pope makes it very clear that far from being an intellectual force of the dead and distant past, Thomas' teaching is still a great living reality in the world of thought and philosophy. Leo XIII, himself a distinguished scholar was an intensely practical and thoroughly modern ruler, above all without any of the qualities that would stamp him as a nebulous mystic whose thoughts were warped by any real or supposed medieval barriers.

When the Pope promulgated this decree he was only formulating as a rule what has become spontaneously the almost constant and universal practise and tradition of Catholic schools and universities. Even those who disagree with Aquinas in certain few points of philosophy and theology are quite ready to confess his greatness and to admit that no one has ever taken the whole field of philosophy and theology for his work and accomplished so much. The more one knows of St. Thomas the more is he respected. Only those despise

him or make little of him who have never taken the trouble to give time enough to understand his work. Quite needless to say he is not always easy reading, but that is not because of the obscurity of his teaching, but because of the profundity of the problems he treats and the depth of his speculations, on them. No philosophic writer ever has expressed so exactly or with such scrupulous nicety his absolute meaning about the most important distinctions of thought on the most significant questions of philosophy and ethics as St. Thomas. While he had a magnificently speculative intellect, he had also a thoroughly practical mind, and in applied ethics his opinion is quite as valuable as it is with regard to the great underlying principles of speculative philosophy and dogmatic theology.

Anyone who thinks, however, that St. Thomas represents mere speculation, that is, deductions and a priori reasoning from assumed principles, will be quite surprised to find what a wealth of knowledge and information with regard to all subjects of which he treats, Aquinas possesses. In our own time Herbert Spencer amazed his generation by the wealth of his information and the almost infinite detail of his knowledge in scientific matters. I venture to say that those who know their Aquinas best would be quite ready to declare that the medieval philosopher had compassed more of the information of all kinds possessed by his time, or what his generation thought to be information, than anyone has ever had and that in this respect Herbert Spencer, in spite of all his marvelous accumulation of information, was far surpassed by his colleague of the thirteenth century. Above all, St. Thomas knew the science of his time very well. He constantly used his knowledge in his philosophical writing. There is never any display of erudition for erudition's sake any more than there is in Dante. He constantly reverts to the conclusions of scientists and as his great teacher and brother Dominican, Albertus Magnus was a scientific genius of the highest order, acknowledged as such now by all who know his work, who had written books on many subjects in physical science, Thomas' oppor-

tunities to secure information can be readily understood to have been of the best.

Perhaps the best standpoint of comparison between the supremely human significance of our nineteenth century philosophers and that of the thirteenth century Italian can be found in the attitude of poets toward them. It would be hard to think of a great poet using any of our modern philosophic systems much less the dry bones of scientific speculation, as the basis of a great poem or a series of poems. It has often been said however that Dante in writing his immortal poem lifted St. Thomas' *Summa* into sublime poetry. All the ultimate problems of man's relation to the Creator and to the universe are treated with a completeness and a thoroughness by St. Thomas that his book very naturally became the quarry out of which a great poet obtained his materials. The works of the Angelic Doctor have been the source not only of supreme poetry, but of marvelous books of devotion and of mystical philosophy. They have been the consolation of many who are not occupied with the thought of having to teach them, or comprehend their conclusions for intellectual satisfaction, but because they find in them the most workable material for their sermons, their meditations and even most of what means much for the direction of the daily lives of themselves and others.

Perhaps the most surprising thing about St. Thomas is his anticipation of many quite modern problems in philosophy and even in science. There are many of the ardent followers of Aquinas, who insist that the whole of Kant's philosophy is anticipated in certain objections which St. Thomas urges against his own teaching and which he answers very effectively. No one has ever stated opponents' objections with such sincerity and force as Aquinas. His teaching with regard to evolution is very interesting, and though he was an Aristotelian he is quite favorable to many modern evolutionary ideas. Aristotle has stated and rejected the doctrine of natural selection. He believed in evolution, but not the evolution of Democritus of which our modern systems are the

descendants. In spite of this St. Thomas, commenting on St. Augustine whose expressions he is amplifying and supporting insists that creation was not of individuals nor even of species, but of "the seeds of living beings," so that a development was to be expected. St. Thomas even suggests quite formally and explicitly that new species may arise in the course of the life of living things and that they are the result of the natural laws that exist in creation. His whole discussion of the subject of creation shows how much of respect he had for the opinion of serious students of physical science, even in that time when science was so much less well informed than it is at the present time.

The more one knows of Aquinas the more thoroughly he is admired. His ideas with regard to matter for instance are in anticipation of many of the notions that are usually supposed to be quite modern. As we have seen in the chapter on Physical Science he was teaching in the thirteenth century not only the indestructibility of matter, but also the conservation of energy, and his doctrine of the composition of matter resembled very closely that of the modern physical chemist.

Another of the great Italian philosophers of this fertile time was Bonaventure, the general of the Franciscans, a contemporary of Aquinas, who has also received the title of Doctor of the Church, and because his writings refer to the mystical side of religion and philosophy, he has been called the Seraphic Doctor. He has always been a favorite study of his brother Franciscans, and they have been distinguished for learning down the centuries. Besides, many of the Popes have referred to him in the highest praise. Leo XIII calls Bonaventure "the Prince of Mystics" who "having scaled the difficult heights of speculation in the most notable manner treated of mystical theology with such perfection that in the common opinion of the learned he is *facile princeps* in that field." While Thomas was a marvel of analytical intellect, Bonaventure was a synthetic genius. His works have been issued with commentaries in many editions. In the fif-



SINGING GALLERY OF THE CATHEDRAL
Lucca Della Robbia 1400-1482

teenth century, just after the invention of printing, but three centuries after their author's death, no less than fifty editions of Bonaventure's works appeared. He is still fondly studied by a great many deep scholars, and looked upon by them as one of the great thinkers of all time whose influence has continued to exert itself all down the centuries.

Perhaps the most interesting phase of the work of both of these men, St. Thomas and St. Bonaventure, is that besides being philosophers they were poets, and that too, among the greatest. Aquinas has taken the deepest problems in devotional theology in his hymns to the Blessed Sacrament, and in spite of their profundity of thought and the necessity for the most careful expression to satisfy theological dogma has made very beautiful, indeed sublime poetry. Several of his hymns are considered as having a high place among the very greatest in use in the Church's liturgy. The *Lauda Sion Salvatorem* and the *Pange Lingua Gloriosi* must be numbered among the most sublime religious poems ever written, worthy of a rank among the seven supreme hymns of the Church. Some of St. Bonaventure's are scarcely less famous. That the men who were the most influential teachers of philosophy at the greatest university of the time, that of Paris, should also be the authors of such sublime religious poetry can not but be a never ending source of surprise. Bonaventure's hymns are among the sweetest that there are in all the religious poetry, and only those of St. Thomas with the *Dies Irae* and the *Stabat Mater* excel them.

It is sometimes the custom to think that this old scholastic philosophy is entirely out of date, and no longer of interest to men. Such a thought however, can come only to those who have not taken the pains to study the old philosophers. Their philosophy is no more antiquated than their great hymns which are still familiarly used throughout the world and no more out of date than Dante, their intimate poetic disciple, who has attracted more attention in the later nineteenth and twentieth centuries than in almost any century since his death. Dante is after all the poet of scholastic philosophy owing

WHAT CIVILIZATION OWES TO ITALY

the basis of all his poetic speculations to the philosophers of the thirteenth century and particularly to Aquinas. The greatest poets and critics of the modern world are agreed that so far from humanity having outlived serious interest in Dante, no one has expressed the philosophic significance of life on the background of eternity as Dante has done it.

Dr. Stanley Hall has recently suggested some of the anticipations (they might easily be multiplied) of modern thought in the philosophic writings by Italians of centuries ago. They serve to emphasize for us that unwelcome thought of the modern time that man's intellectual life is not progressive, but runs in a series of cycles occupying itself with different phases of thought at different times, but in recent centuries at least constantly recurring to previously discussed notions. He suggested that it would be only too trite to show in detail "how Anselm in his famous arguments of God was followed by Descartes, and in his *credo quia absurdum* by Jacobi, who found a light in his heart which went out when he tried to take it into his intellect, or how Bonaventure anticipated Schelling's intellectual intuition, and Fichte's blessed life." He adds, but "such comparisons are endless and belong elsewhere."

The Italians had been the leaders in the development of scholastic philosophy, the greatest thinkers and writers among the scholastics having been born in Italy. Modern deductive philosophy then, is largely theirs. It is usually thought, however, that inductive philosophy came from the West of Europe. In the minds of most people in the English speaking countries the name of Francis Bacon is associated with the development of induction as a philosophic method for the acquisition of truth, and its adoption among educated men to replace scholasticism and the philosophy of deduction is commonly attributed to him. Francis Bacon had, of course, been long anticipated in all that concerns the inductive method in science by many of the Greeks and even in modern times by his much greater namesake, whom now after seven centuries we are beginning to appreciate more properly, Roger

Bacon. Even the formulation of the principles of inductive philosophy, so as to make them popular, was not due to Francis Bacon, but to Italian writers on philosophy, among whom Cardano or as we usually know him in English, Jerome Cardan, Bernardino Telesio, Giordano Bruno and Campanella are well known by all those acquainted with the history of philosophy.

Of Cardan's place in this regard we have spoken in the chapter on Physical Science. Telesio is looked upon as the founder of the school, and in his work *De rerum natura juxta propria principia* he advocates the use of the empirical method of investigating nature, and formulates a system according to which the universe results from the combination of three principles, *matter, heat and cold*. The first part of this work was published in Rome in 1565 where Telesio had resided for several years, enjoying the patronage of Pope Paul III. His place in the history of philosophy and of science is well recognized. In *Science* for December 19th, 1913, Professor Carmichael said of his work:

"He abandoned completely the purely intellectual sphere of the ancient Greeks and other thinkers prior to his time, and proposed an inquiry into the data given by the senses. He held that from these data all true knowledge really comes. The work of Telesio, "marks the fundamental revolution in scientific thought by which we pass over from the ancient to the modern methods." He more than any other unloosed men's minds from Aristotle.*

Telesio is very little known outside of Italy, though one of his contemporaries, Giordano Bruno, is very well known. The reason for the difference is that Telesio confined his speculations to scientific matters, avoiding the thorny problems of religious controversy and political philosophy. The reputation of Bruno is due entirely to the fact that he was persecuted for holding certain opinions subversive of both

* The innuendo that preceding philosophers had depended too much on Aristotle to the extent of blinding their own intellects by worship of him is true only for the lesser writers, not for the great thinkers who admired Aristotle very much, but criticized his conclusions quite freely. None did this more effectively than the great Italian scholastics.

religion and government and was finally put to death. Bacon confesses his obligations to Telesio whom he frankly hails as the first experimental observer of nature. Campanella, who has a much wider fame than Telesio, because he too is supposed to have been persecuted for his views, though his troubles were all due to politics, wept at Telesio's tomb, confessing him to be his great master. Telesio's philosophic sensationalism, Garnett suggests, helped to mould the thought of Hobbes and Gassendi.

Giordano Bruno was, as we have said, a disciple of Telesio. Though Telesio had been on terms of intimate friendship with the Pope and ecclesiastical circles in Rome, Bruno teaching practically anarchy soon found himself in trouble with the political as well as the ecclesiastical authorities of the time. He wandered over Europe everywhere setting men by the ears, attracting wide attention, but always also opposition and persecution. His doctrines are in many ways absurd, though in others they represent many modern tendencies. For him the universe was ruled absolutely by law, and there is no place for human freedom in his system of determinism. His philosophy is almost pure pantheism. It is he and not the coldly intellectual lens grinder of Amsterdam, Spinoza, who should have been called "the God intoxicated man." Bruno declared that "soul is an emanation from the divine universe and all organisms are composed of living monads each of which reflects all reality." (Turner.) Many modern philosophic speculations are anticipated by Giordano Bruno and even Spinoza, who influenced the philosophy of our time so deeply would seem apart from his ethical doctrines, to have owed much to him.

Bruno, in spite of the place that is usually assigned him as the founder of modern naturalistic philosophy, remained all his life a metaphysician and poet. The most interesting of his works has been declared to be his *Gli Eroici Furori*, The Heroic Furies, a dythyramb in prose and verse on the progress of the soul to union with the Divinity, which was dedicated to Sir William Sidney. The book emphasized very

clearly the extent of Bruno's influence all over Europe. Bruno owed his education to the Dominicans, among whom he passed his earlier years, though his philosophic system owed very little to any education that he had secured or to his reading, for it came mainly from his own intuitions and from a deep poetic quality in his nature, with much of the unbalancedness of genius about it, and it is this that at once secured him his following, and yet aroused bitter opposition wherever he went. He was a man born before his time, though it is doubtful whether without the friction of opposition that he encountered we would have had from him the brilliant speculations we now have.

Campanella, like Bruno, became a Dominican and having become interested in Telesio's philosophy, wrote on the subject. He was very ardent in the expression of his views and applied some of them to questions of government and social rights and duties. As a member of a religious order he was summoned before the Holy Office in Rome, but after a careful examination of his writings only a warning seemed necessary and he was permitted to return to Naples where, however, he soon got into the hands of the civil authorities on the charge of aiming to set up a communistic commonwealth. He was sentenced to perpetual imprisonment, and even the efforts of Pope Paul V were not sufficient to secure his release. Through Pope Urban VIII, who interested himself directly with Philip IV of Spain, Campanella was at last released, but another conspiracy was discovered among his followers in 1634 which threatened his freedom once more. With the aid of Cardinal Barberini and of the French Ambassador De Noailles, Campanella succeeded in escaping to Rome before he could be apprehended, and was afforded a refuge in the Papal capital. Louis XIII and Richelieu received him with marked favor, granted him a liberal pension, and he spent the rest of his days in the enjoyment of ecclesiastical patronage in the Dominican Convent of St. Honore at Paris. He is one of the most influential writers on philosophy of his own time, and Cardinal Pallavicini declared him

a "man who had read all things and who remembered all things; of mighty but indomitable character." There has always been a division of opinion among theologians as to the place of his doctrines, though the great De Lugo, afterwards Cardinal, held his opinions above suspicion. John Addington Symonds refers to him as the "audacious Titan of the modern age possessing essentially a combative intellect; a poet and philosopher militant, who stood alone, making war upon the authority of Aristotle in science, of Machiavelli in statecraft and of Petrarch in art." His teaching is rather critical of others' opinions than in any sense constructive, but his enthusiasm for the study of nature made him a man of European influence at a time when every scholar read Latin, and when his *Universalis Philosophia* was in nearly every scholar's hands. While inductive philosophy is usually thought of as more modern than the Renaissance and non-Italian in origin, as a matter of fact the great impetus to that mode of thinking as in older times to scholasticism came from the Italians. They were not only the pioneers in its modern application, but also the teachers and writers whose books spread the doctrine all over the intellectual world.

After the sixteenth century mental philosophy as a discipline gave place to scientific philosophy. One of the great contributors to modern thinking in that department was, of course, Galileo, though he was entirely of too practical a genius to be what would be called a speculative philosopher. In politics Machiavelli occupies for good or ill a place and influence corresponding to that of Galileo in science. While Descartes, Spinoza, Leibnitz and Kant were piecing together the philosophic speculations that were to occupy most of the attention of the philosophic students of the eighteenth and nineteenth centuries, there are no equally significant Italian writers on philosophy. As has been pointed out however, practically all that these men developed were ideas suggested by Italian speculators of earlier centuries. Kant's whole position was stated in one of Aquinas' great questions and definitely rejected by him. Descartes, Fichte, Schelling,

Spinoza were, as Prof. Stanley Hall suggests, correspondingly anticipated. There is nothing new under the sun in philosophy.

About the middle of the nineteenth century Italy once more became an important centre of philosophic influence. The neo-scholasticism which has ever and more deeply impressed itself on modern serious thinkers developed in Italy, and had its greatest exponents in the Italian schools. One of the most important nineteenth century philosophers, in the sense that his teachings attracted wide attention and exerted profound influence far beyond Italy itself, was Rosmini. He revived many of the old ontological ideas that is of the foundation of our knowledge on the idea of Being, but he also treated many other and more practical philosophical questions. His writings were the subject of much discussion in Italy particularly, but the echoes of the controversy were heard all over the world. Our own Thomas Davidson here in America was deeply taken with Rosmini's philosophical system and discussed it in a volume published in 1882. There are many other works in foreign languages written with regard to him. Very properly his life finds a place in the French series of *Les Grands Philosophes*. Whatever may be thought of his philosophic teaching there can be no doubt at all about the purity of his motives, and the exemplariness of his life. The Institute of Charity which he founded remains as his monument, and contradicts the prevalent impression that founders of philosophic systems are almost necessarily impractical men so wrapped up in their speculations that they have no time for the solution of pressing social problems. Rosimini's Institute of Charity, whatever the fate of its founder's system of philosophy, is destined to do great good for many generations.

When in the nineteenth century after many vicissitudes scholastic philosophy came into its own again, it was a distinguished band of Italian scholars and teachers who were mainly responsible for its revival. As a rule their names have not been known outside of Italy and the Catholic institutions

WHAT CIVILIZATION OWES TO ITALY

of learning throughout the world, but as scholasticism came once more into its proper meed of recognition the Italian initiative in this, as in so many other intellectual movements, was properly appreciated. The Italians deeply influenced Cardinal Mercier and many other conservative teachers of philosophy. This recent development represents the constantly recurring exemplification of the principle that Italians have nearly always in modern history been the leaders in philosophic thought and the teachers of the world. Above all they have been noted for the perfect clearness of their views and teachings, even with regard to the most intricate and knotty subjects. While men of other nations have been obscure and dubious, even, for their students so that one of the most influential philosophers of modern times, Hegel, is said to have declared that only one man in Europe understood him and that he did not completely understand him, and the meaning of even the basic principles of his German colleagues Kant and Fichte are a bone of contention sometimes among their most ardent disciples, Italian philosophic thought has always been noted for its clarity and Italian writing on philosophic subjects for its lack of obscurity, even when the themes were most difficult.

LAW

WHILE the world's debt to Italy for great achievement in all the arts is universally acknowledged, and her important contribution to literature and to education has always been well recognized by those at least who are in familiar touch with these subjects, and while in recent years with the growth of our knowledge of the history of science the obligation that civilization is under to Italy both for her own many great scientists and for those of other nations who went to her for opportunities for teaching and investigation has come to be better appreciated, there remains another department of human accomplishment in which comparatively few even of those whose life interests bring them closest to it realize how much we are all indebted to Italy. This is the department of law. In recent centuries the important contributions to law have nearly all come from other nations, but there is a full millennium and a half perhaps even more during which Italy was almost literally the law giver of the world. Besides the Roman law which is the foundation of all our modern jurisprudence and its splendid modification through Christian principles to meet human problems — an achievement which we owe to the Italians of the early Christian and medieval centuries — there is a thousand years of the Middle Ages during which Italy was the world's teacher in law.

Most of our modern law is of course founded on the old Roman law of Italian origin. The one great original contribution to the history of human thought that the world has from the Romans is the system of Roman law. The citizens of this military republic, in spite of their aggressive tendencies

WHAT CIVILIZATION OWES TO ITALY

towards other nations around them had an abiding sense of justice among themselves and crystalized this in a great system of law. While they imitated Greece in philosophy, in literature, in art, in education, their civic ethics were their own, representing a distinct advance over anything that the world had seen up to this time, so far as human wisdom is concerned. Roman law has been the basis of all succeeding legislation, and has been a favorite subject of study for all great lawyers ever since. Without it the world would have missed a distinct phase of evolution of great import for the race, and while we are concerned more here with the debt to Italy in the modern times, this contribution to civilization must at least be mentioned.

When Christianity came it was in the order of Providence so placed at Rome that the system of Roman law naturally became the basis of Christian law making. Two months after Constantine in 312 A. D. had won the decisive battle of the Milvian Bridge he published the famous edict of Milan, which established liberty of worship. While there are historians who minimize Constantine's Christianity and hint at the self interest which could so well have been a prominent motive in making him accept Christianity as the religion of the Empire, the Imperial Laws which we have from him show very clearly a definite effort to modify Roman law in accordance with the principles of the Gospel, yet without doing so much violence to long established traditions as would give just cause for complaint of the violation of vested rights. The best evidence that there was a new spirit introduced into the Roman Imperial Legislation at this time is to be found in the opinion expressed by the pagan writer Nazarius, who in 321 said of Constantine's legislative reforms "New laws were established to maintain a high standard of morality and to limit vice. Constantine set aside many of the old legal technicalities of procedure which were a source of injury to the poor and simple. He upheld decency and strengthened the marriage tie."

Under Constantine the Christian custom suggested by

St. Paul in his first epistle to the Corinthians of submitting differences to the bishops for arbitration and decision so as to avoid the disturbing necessity of appeal to the lower courts which so often led to violations of Christian charity, was sanctioned by the civil law. Indeed, all cases concerning the clergy themselves or dealing principally with religious matters and claims, were by law referred to the bishops, and out of this developed the ecclesiastical jurisdiction which came to occupy so prominent a place in legal affairs during the Middle Ages. Where both litigants in a civil case asked that the bishop should be appointed arbitrator, this was done by law, and as a consequence St. Augustine complains that the bishops came to be so much occupied with the adjudication of cases that they had not sufficient time for spiritual duties, though as a rule they did not complain, because their legal position gave them opportunity to be the defenders and advocates of the poor and needy and of the widows and orphans.

The first legislation with regard to compulsory Sunday rest which was to mean so much for the laboring classes in the aftertimes was inaugurated by Constantine, and continued by his successors. It was not long before this legislation also included freedom from the necessity of laboring on Church holy days of obligation, and these gradually multiplied until an average of at least one in every ten days besides Sunday was a day of rest.

Standish O'Grady, to whom the Irish literary revival owes so much, on a recent visit to New York, called attention to the fact that twice in the world's history when great works of art were accomplished and literary and philosophic thought made achievements which the world will never willingly forget, in the fifth century before Christ in Greece, and during the Middle Ages in Europe, one third of the time of the people who originated these great accomplishments was given over to leisure in preparation for, or in the celebration of, religious festivals. For the leisure of the Middle Ages Italy is more responsible than any other nation. The laws regulating

it gradually developed as the Christian Spirit invaded more and more the Roman law.

Perhaps the finest development of law that came was that which concerned provision of care for the ailing poor. This was entirely a Christian development, and hospitals and what we would now call free dispensaries, as well as the visiting of the ailing poor in their homes by the members of the order of deaconesses, who in the course of time through experience became skilled attendants was introduced and became a feature of municipal care for citizens. Side by side with this ran regulations for the care of slaves and the laboring classes. Constantine was the first to decree that the master who killed his slave was guilty of murder. He forbade the separation of the members of a slave's family except under circumstances regulated by law. He decreed that a master might not expose the children of slaves. Above all it was made easy to enfranchise slaves and the teaching of the Christian principles of the equality of all men in the sight of God encouraged enfranchisement. The social inferiority of freed men which had been emphasized by the Roman laws was now obliterated.

Other emperors followed the good example of Constantine and gradually introduced more and more Christian elements into legislation, particularly in all that concerned the care of the poor. The Emperors Valens and Valentinian issued a decree not only empowering the bishops to prevent imposition on the poor by high prices, but especially that they should take care that in times of special necessity merchants should not raise the price of their goods to the injury of the poor. Later the Emperors Leo and Anthemius issued decrees placing the insane and orphans under the special protection of the Bishops, and requiring them to see that all those who needed such special care were to be provided with proper tutors and guardians. The same Emperors by a piece of legislation that seems somewhat strange to us, placed upon the bishops the duty to see that the soldiers obtained the rations allotted to them and were not deprived of them by

chicanery of any kind or by the graft tendencies that have always exhibited themselves in the history of human nature whenever the opportunity presents itself.

It was not long before the principles of Christianity found their way into every portion of the Roman Law, and particularly all that referred to the place of the ruler in matters of law so as to modify the ancient autocracy and imperialism in the direction of responsible sovereignty. This will be best appreciated from some of the edicts of the Christian emperors themselves. The Emperors Theodosius II and Valentinian III proclaimed humbly in 429 "the dignity of the sovereign requires him to acknowledge that he is subject to law. Our power is nothing else than the power of law; it is much nobler to submit to the law than to command others to obey it. Our aim in the present edict therefore is to make others know what we forbid ourselves doing." The Emperors Leo and Anthemius made a very similar proclamation declaring that "a good prince believes that he can do only what is allowed to individual citizens; and if he is liberal he wishes to be so according to law." No wonder that Prof. Boucaud should insist in his work on the influence of Christian law on the Roman law* that Christianity brought about an almost complete modification of the Roman Law in favor of all those who were likely to suffer injustice in any way from the sterner provisions of the Roman law.

Not only did Christianity bring about a modification of Roman law and the introduction of Christian principles, but above all the spirit of Christianity secured the enforcement of the law equitably for the rich and the poor, for the weak and the powerful. The example of St. Ambrose bringing even the great Emperor Theodosius to acknowledge his fault and to do public penance for it, must have meant very much in impressing respect for law and authority on the people of the time.

In the meantime the care of the poor and the ailing

* *La Première Ébauche d'un Droit Chrétien dans le Droit Romain* par Chas. Boucaud, Paris Tralin 1914.

WHAT CIVILIZATION OWES TO ITALY

became an important principle in the Civil Law under the Christian Emperors. Even Julian the Apostate, in a letter to Arsacius, High Priest of Galatia, quoted by Sozomen, shows very clearly that he was convinced that Christianity would continue to spread and gain in influence throughout the world unless those who clung to the state religion could rival the new religion in its care of the needy. He attempted in many of the cities of the Empire to secure the erection of institutions that would rival those of the Christians, but found that while Imperial power could supply material resources, the inner spirit that made Christianity so fruitful in its charities was lacking.

Professor Boucaud has pointed out other developments of law which came under Christianity and which had their origin in Italy. The old Roman idea of the father as having power of life and death over the members of his family was modified, and parental despotism greatly lessened. The children of a first marriage were protected in their rights when a parent married again, and widows were accorded by law a fourth of their deceased husband's property by inalienable right. Naturally pious foundations and works of charity were encouraged, and it must not be forgotten that this represented a development of humanitarianism which had practically never occurred before. The old Pagan laws discouraging celibacy were abolished and much more human freedom was secured in every way. Above all the Christian dispensation as worked out in Italy mitigated the severity of prisons, and abolished some of the harshest penalties, as well as bringing about a gradual diminution of torture.

The most important Christian modification of the Roman Law came under the Emperor Justinian. He is one of the greatest Italian products, one of the epoch making personalities we owe to the peninsula. Only such men as Julius Caesar, Gregory VII and Napoleon, (all of them Italians) deserve to be mentioned in the same breath with him for his power over his own generation, and the influence that his achievements material and intellectual have had over all sub-

sequent history. Justinian was a great military genius, possessed of a marvelous legal mind, and in addition by a surprisingly uncommon combination, a good taste in the arts. All these qualities taken together enabled him to consolidate the empire, to lay the foundations of a wonderful development of law, and to initiate a marvelous period of architectural expression. It is with his law making that we have to do here.

Conway in his article on *Christianity and the Roman Law** to which I owe other references on this subject, has summed up Justinian's contributions to law in one very full paragraph:

"The Christianizing of the Roman law reached its full development under the Emperor Justinian in the sixth century. The Corpus Juris Civilis has been compared to the Bible for its influence on the history of Christian civilization. The law codified by Justinian was essentially different from the law set forth by the juriconsults of the first three centuries. It was promulgated in the name of the Lord Jesus Christ, and under the auspices of God; it spoke plainly of Divine Providence and of the Sovereign Trinity; the imprint of the Gospel teaching was evident on nearly every page. Justinian was not a mere compiler of the old Roman law; he was in a true sense a legislator, who wished to breathe a new spirit into the pagan code of the old classic juriconsults. Despite its technical perfection, the pagan code knew nothing of the piety, humanity and benignity which characterized the Justinian code; its crude individualism was utterly alien to the Christian idea of charity and brotherly love, and the Christian notion of the paramount importance of the general interests and the common good."

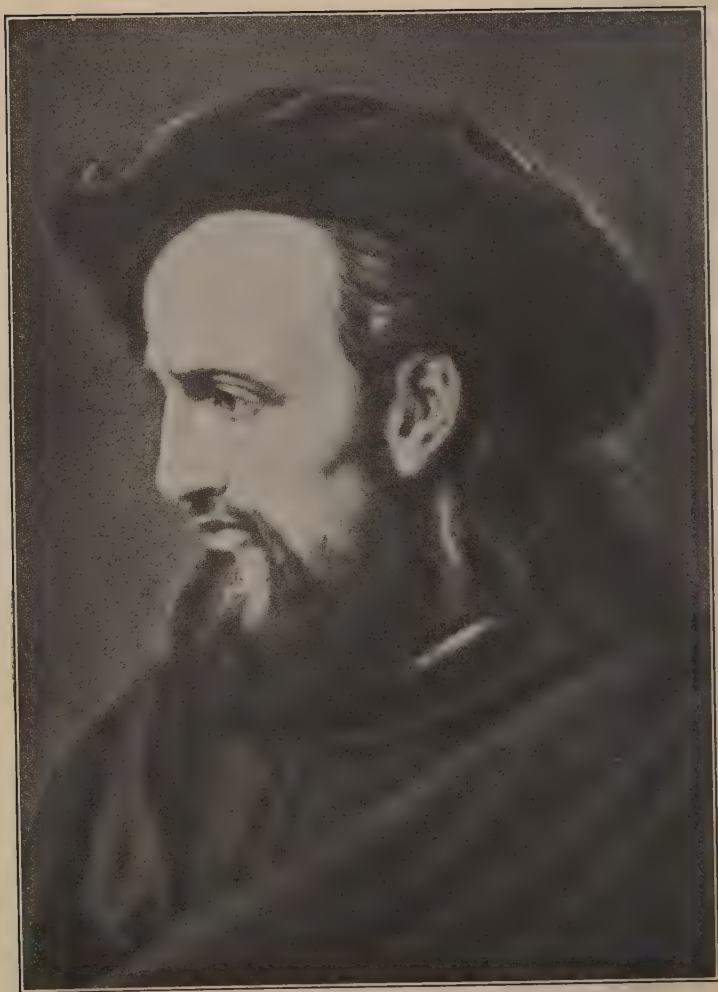
The spirit behind the law, which means so much for its righteous interpretation, was fostered in the spirit of the highest humanity by that great genius ruler, Pope St. Gregory the Great, at the beginning of the seventh century. He insisted particularly on the duties of the rich toward the poor.

* Catholic World, April, 1914.

He declares in one of his moral homilies that "the poor are not the clients of the rich, but the rich are the mystical clients of the poor, depending upon their friendship to attain eternal life." Gregory insisted that the main duty of the man who had surplus means must be to care for others, and that the fulfillment of other duties could mean comparatively little for him unless that one were carefully tended to. Alms giving to a considerable proportion of the income was not merely a counsel of perfection but a strict moral obligation. Gregory himself as Pope was one of the largest land owners in the world of his time. He gave the example then by emptying the treasury of the Church by his excessive benefactions. It is not surprising to find that he took a firm stand in the matter of defending the Jews against the bitter persecution to which they were often subjected, and which was supposed to be founded on Christian principles. Gregory did not hesitate to stigmatize anti-Semitism as absolutely contrary to all Christian feeling.

Probably the greatest legal benefit ever conferred upon mankind was that which came as the result of Christian legislation as to rest for workers on the sabbath and on the church holy days. This too was due to the great Italian churchmen of the early Middle Ages particularly who secured the enactment into the civil law of legal regulations governing the matter or obtained such predominance of the canon law as had the same effect. The holy days increased in number until there were over thirty of them in the year so that besides Sunday there was a day of rest and recreation more than once every two weeks. Neither Sundays nor holy days were kept in Puritanic fashion, but after the required attendance at church men were free to recreate both in mind and body for the rest of the day. There are some who think that this development of law was unfortunate because it gave too many days of rest, but Standish O'Grady's opinion quoted above may stand against this.

This fine Christian phase of law then, so far from doing harm had exactly the opposite effect, and gave men the chance



CORREGGIO (1494-1534)

to occupy their minds with thoughts which were really worth while, and encouraged genius to express itself in great works that would occupy the leisure of the less gifted on these days of rest and recreation, and above all provided an audience who had the time, because they were not permitted to do servile work, to give to the appreciation of beautiful works of literature and of art. As a matter of fact it was in Italy itself where the regime of frequent holy days was most rigidly enforced and encouraged under the patronage of the Popes, that the magnificent development of the later Middle Ages, usually known as the earlier Renaissance, came. The result of it was a whole series of monuments of letters and art that endure in the admiration of mankind ever since.

Important developments in formal law came with the evolution of every mode of intellectual achievement in the latter part of the Middle Ages. The generations that created the universities and developed modern painting and architecture as well as achieved such marvelous success in the arts and crafts and whose literature lifted itself up to a wonderful culmination in Dante could scarcely be expected to neglect law. In the twelfth century began the development of Canon Law. Gratian compiled his *Concordantia Discordantium Canonum* about the middle of this century. He is the true founder of the science of Canon Law. The interest aroused in the subject of law by Gratian's work and that of Irnerius who about this same time at the instance of Countess Matilda of Tuscany devoted himself to the study of jurisprudence, taking the Justinian Code as a guide, soon worked a new evolution of both Canon and Civil law. Irnerius introduced the custom of writing explanatory commentaries or glosses on the margins of the old law books. He wrote a *Summa Codicis* which has recently been edited with a critical introduction by Fitting, who has also issued other editions of Irnerius' works in connection with the celebration of the Two Hundredth Anniversary of the Foundation of the University Halle-Wittenberg, so that at last this pioneer teacher and writer on law of medieval Bologna is coming to his own of

WHAT CIVILIZATION OWES TO ITALY

recognition as a great original genius for organization in jurisprudence.

Irnerius' writings and lectures together with Gratian's work attracted world attention to Bologna, and when that institution of learning came to be a university its law school was by far its most important department. A series of distinguished professors did work there which represents foundation stones in the modern science of law. Pope Innocent III, who was a student of the law school of Bologna himself, and one of the greatest jurists of his time reorganized Canon Law so thoroughly and influenced Civil Law so much that he deservedly came to be known as *Pater Juris*, father of the law. His successors on the Papal Chair in the thirteenth century were distinguished for their attention to law. Pope Gregory IX commissioned his Chaplain the famous Raymond of Pennafort, who had been a professor of Canon Law in the University of Bologna, to codify all the decretals since the time of Gratian. This work was officially issued in 1234, four years of labor having been devoted to it. The laws are in the form of decisions announced in cases submitted to the Pope from all parts of Christendom, including many from the distant East—not a few from England and Scotland. Gregory's decretals were published in five books; a supplement under the name of the sixth book was published under Pope Boniface VIII in 1298, the last Pope of the great organizing Thirteenth Century, who had also, like Pope Innocent III received his legal training at Bologna, and was looked upon as one of the greatest jurists of his time.

This sixth book is interesting because for the first time abstract rules of law are laid down extracted from actual judgments made in the cases published not only in this book but in the five preceding books. This advance in legal formulation was doubtless due to Pope Boniface's interest in the subject of law. At the end of the thirteenth century both the Canon and the Civil Law had mainly through Italian interest in the subject and the persistent intellectual efforts of great scholars and administrators of the peninsula, been

brought into the form in which it exists at the present time and very little has been added to it since. The thirteenth was of course the century of the establishment of fundamental laws in all the countries of Europe, Magna Charta in England, the *Forum Judicum* of Louis IX of France, the basic laws of Spain under Louis' royal cousin St. Ferdinand III, the Golden Bull of Hungary, but Italy far surpassed other countries in her accurate formulation of law and in her scientific organization of it.

During the fourteenth century Padua became the great and successful rival of Bologna in the teaching of law as well as of medicine. The two important departments of civil and canon law were developed and the subject matter still further formulated. Men usually took the two degrees in these disciplines, hence our modern "doctor of laws" and not merely of law, just as those who were to study science took the paired doctorates in philosophy and medicine. Padua was under Venetian influence and was encouraged in every way to develop its teaching.

Very probably one of the best bits of evidence for Italy's development of law is to be found in her pioneer legislation for the regulation of the practice of medicine. It is usually presumed that the practice of medicine was on a very low plane during the Middle Ages, and that while only little was known about medical science, the methods of practicing the medical art were crude, as befitted an earlier time in evolution before modern advances had come. Any such impression is founded entirely on ignorance of the conditions which actually existed. In his studies in the history of anatomy in the Middle Ages, Von Töply quotes the law for the regulation of the practice of medicine issued by the Emperor Frederick II in 1240 or 1241. The law was binding on the two Sicilies, and shows exactly the state of medical practice in the southern part of Italy at this time. Everything that we think we have gained by magnificent advances in modern times is to be found in this law. A physician must have a diploma from a university and a license from the government; he must

WHAT CIVILIZATION OWES TO ITALY

have studied three years before taking up medicine — then four years in a medical school, and then must have practiced with a physician for a year before he will be allowed to take up the practice of medicine on his own account. If he is to take up surgery, he must have made special studies in anatomy. The law is especially interesting because of its regulation of the purity of drugs, in which it anticipates by nearly seven centuries our Pure Drug Law of the beginning of the twentieth century.

Physicians were forbidden to keep apothecary shops nor to "take any of them under his protection nor incur any money obligations in their regard." Manifestly they realized all the possibilities of abuses. The apothecaries had to prepare their drugs under State inspection, and any fraud in drug making or substituting was punished by the confiscation of their moveable goods. They were definitely put out of business. If the government inspectors allowed any fraud they were to be condemned to death. Medieval law makers did not believe in allowing any playing of fast and loose with human life. We need some of their straightforward directness in legislation and many fewer laws at the present time.

In the century before Frederick's legislation, indeed as early as 1140, King Roger of the Two Sicilies had promulgated the law:

"Whoever from this time forth desires to practice medicine must present himself before our officials and judges, and be subject to their decision. Anyone audacious enough to neglect this shall be punished by imprisonment and confiscation of goods. This decree has for its object the protection of the subjects of our kingdom from the dangers arising from the ignorance of practitioners."

In a word the Italian legislation for the regulation of the practice of medicine and for the maintenance of standards of medical education anticipate our modern ideas by some eight centuries. Probably nothing illustrates so well the thorough going legal sense of the Italians in a great practical way as this. We have come to realize how much such legal regulation

means for the health of the community and for the progress of scientific medicine. Above all we have learned to appreciate how much it means for the prevention of serious abuses, and the medieval Italians manifestly had the same realization.

What is not usually realized is the genius of the Italian people for the practical organization of human affairs so as to facilitate the transaction of all manner of business. President Stanley Hall pointed out in his address on *Medieval and Modern Universities* (The Catholic Educational Review May 1915) how much the world owes to Italy's successful efforts in the erection of a great structure of law and the thorough organization of its teaching. He said:

"The chief secular problem of the middle ages was to reorganize the world of business, government and society. To-day we seek only to improve what they were obliged to create almost *de novo*. Their chief instrument to this end, as Savigny has best shown us, was Roman law. Deeds and contracts, courts and judicial procedure, inheritance and succession, corporations and charters, the status and rights of the various social classes, the kinds and functions of officials, taxation, crime — all had to be provided for. Besides the *Codex of Justinian* in twelve books, which was at first all that was known, there came a little later the fifty books of the Pandects, digesting the results of fourteen centuries of legal experience, unknown till Irnerius introduced them at Bologna in the twelfth century, and thus created anew for the modern world the profession of law, which henceforth was taught not as a branch of rhetoric as before, but as a vocation requiring long and special study by itself. Henceforth we are told 'law was the leading faculty in by far the greatest number of medieval universities for more than five centuries.' The practical effects of this upon European history and the progress of civilization is incalculable. The law universities recodified the law more efficiently than had been done in the Institutes or other ancient text books, and nothing was more congenial to the unique instinct of the medieval mind for organization than this written reason or Organon of economic

and sociological statecraft. More systematic and comprehensive than many codifications of modern laws, it is still taught beside them in most European countries. Even the constitution and statutes of the medieval, and in many respects those of the modern, French and English universities are based on Roman Law."

As a diminution of the credit owed to her for law organization, Italy is usually supposed to have encouraged or at least not properly suppressed various intrusions upon the rights of the individual as by torture. There is a tradition in this matter but it is not in accord with the facts. The old Roman law used torture as one of the modes of securing evidence. While the Church adopted the Roman law, as far as possible the spirit of that law was enforced without recourse to torture, and indeed a tradition in opposition to torture was established very early. From the beginning the clergy, at any rate of the higher ranks, were made immune to torture. A synod at Rome in 384 pronounced against torture. Torture for treason and usury was still considered justifiable. The Canon law declared that torture was no sin, but a priest must not inflict it, and charity was to be used in all punishment and no confession was to be extracted by torture. The refinements of torture of which the world knows the most belong not to the Italians nor to the Latin nations, but to the Teutonic nations. The "Virgin of Nuremberg," the iron gloves for roasting hands, and the boots for crushing the feet were invented in Nuremberg well on in the seventeenth century. "Little ease" and the "scavenger's daughter" and various refinements of the rack and screw are English inventions, or at least were modified to a high refinement of ingenuity in England. As a matter of fact legal torture in its frequent use and excesses came into vogue after the Middle Ages, and Italy in spite of her long history is smirched less by the story of such abuses than any country in Europe.

During the eighteenth century a series of writers on law in Italy had much to do with introducing the modern period of jurisprudence. Vico corrected some false impressions with

regard to Roman Law. Giannone, who began the movement which led to the subjection of the Church to the State and Baccaria and Filangieri, the former in his book *Dei Delitti é delle Pene* (1763) the latter in his *Scienza della Legislazione* (1783) first emphasized the idea that punishment was meant not to cause suffering so much as to bring about the reformation of the criminal. The idea has been developed largely in modern Italian jurisprudence. Italians at this time, as for instance Antonio Genovesi, were also the precursors in the discussion of those laws of economy which were taken up afterwards by the English school of economic philosophers, attracting so much attention and securing so many adherents during the nineteenth century. In the present drift of things it seems as though what occupied our English speaking forefathers of a generation or two ago will be relegated to the limbo of outworn systems of thought, because the ideas represented only a very partial view of humanity's interests in such important matters as wages and supply and demand, but at least it may be interesting to recall that the initiative in this, as in so many other phases of human thought came from Italy.

Italy's contributions to law and legal procedure and the interpretation of law have continued to be important down to our time. At the beginning of the nineteenth century the most important contribution to law in modern times was made in the form of the Code Napoleon. This has influenced more deeply modern law making in practically all the States of Europe and America than any other legal development. I need scarcely recall here what has been dwelt on elsewhere in this book that Napoleon, in spite of his connection with France and the French form of the name usually used, was of pure Italian origin. As a matter of fact the Code Napoleon owes some of its most characteristic features to the Italian influences under which its author was brought up, for Corsica in his day had belonged to France but a short time, and the people were thoroughly Italian in every way.

At the end of the nineteenth and the beginning of the

twentieth century there are some very important contributions to modern criminology that come to us from the Italians, and indeed they may well be recognized as world teachers in legal matters once more. One of the most important of these contributions to modern criminology is Baron Raffaele Garofalo's work on that subject which has recently been translated* for the *Modern Criminal Science Series* which is being published under the auspices of the American Institute of Criminal Law and Criminology. Garofalo's book which originally appeared at Naples in 1885 has gone through a number of editions in Italy and at least six editions in French, and translations had been made into Spanish and Portuguese before this English version was made. As the separate books of the series in which Garofalo's book appears were selected by a committee consisting of distinguished professors of law and editors of law journals throughout the United States, it is easy to understand that the one reason for including the volume was not any passing fad of the moment, but represented the judgment of men thoroughly familiar with the literature of this subject.

Of the nine volumes announced for publication in the *Modern Criminal Science Series* it is rather interesting to review the nationality of the authors. The first *Modern Theories of Criminology* is by De Quiro of Madrid, a Spaniard; the second on *Criminal Psychology* is by Professor Hans Gros of Gratz, Austria; the third, *Crime, Its Causes and Remedies* is by Professor Lombroso, the fourth is by Professor Saleilles of the University of Paris, the fifth by Professor Gabriel Tarde of the College of France, the sixth by Professor Aschaffenburg of Cologne, the seventh by Professor Garofalo, the eighth by Professor Bonger of Amsterdam, the ninth by Professor Ferri of the University of Rome. Of the nine books by men of five nationalities three are by Italians. This gives some idea of the place that Italian thinkers are acknowledged to represent in the domain of modern penology.

In almost every century of the Christian era then at least for more than 1500 years Italian thinkers and writers have

* Boston, Little, Brown & Co., 1914.

LAW

done very important work in law and jurisprudence and the organization of legal procedure so as to secure justice among men. While other nations have made significant contributions there can be no doubt that Italy has done more than all the other nations of Europe put together in the department of law. Civilization owes indeed a great debt to Italy for this work, though comparatively few even of lawyers realize the origins of law well enough to be aware of how much Italian genius has accomplished for this great discipline of human thinking.

MATHEMATICS

IT IS agreed by all that Italy easily bears away the palm from the rest of the world in painting, sculpture, architecture and all the arts and crafts and that she rivals any nation in literature, but it is commonly felt that as if in compensation for her superiority in art and her great achievements in letters her people have been notably lacking in the ability to make scientific progress and that as a consequence it has been left to other nations to be the leaders of the world in theoretic and applied sciences. Indeed it seems to many that probably the most important reason for the failure of the physical sciences at least to develop until practically our time (an assumption in history which many make) is that the Italians held the primacy in the intellectual as well as the artistic world, yet lacked the scientific temper of mind. This feeling is not so much a reflection on the Italians as a reminder to those who might possibly lose sight of it, that it is but quite natural that an artistic literary folk should be lacking in those qualities of intense close observation and practical intelligence required for scientific progress. The aesthetic and scientific minds are supposed to be altogether different in character and almost if not quite mutually exclusive in make-up.

It is rather difficult to understand just how this impression should have become prevalent for it is of course quite untrue. Italy has done at least as much for world science as for world literature and indeed almost as much as for world art. The Italians have been the great ground breaking discoverers in nearly every department of science. When another name than that of an Italian heads a science,

not infrequently it will be found on looking into his biography that Italy fostered his genius and that he went to the peninsula for opportunities for study which could not be secured at home. Many a great foreign discoverer in science proudly and affectionately looked back upon his years of study in Italy as Linaere did when erecting an altar on the last place in the Alps from which he could see the fair Italian country he had learned to love so well, he saluted this other native country of his as he felt her to be, as the *Alma Mater Studiorum*—the dear mother of studies.

Indeed the world's debt to Italy in science is so great that even a very compressed sketch of the history of Italian science requires a series of chapters, one each on mathematics and astronomy which represent the foundations of the physical sciences, a third on the other physical sciences, a fourth on biological science; for despite the fact that the origin of biological science is usually thought of as due to other nations, Italians have been the founders and greatest contributors. That is why also there have to be additional chapters on medicine and surgery, those practical applications of the biological sciences to man. Her highest claims to recognition as a great national source of scientific discovery and development are, however, founded on the achievement of her sons in the physical sciences, especially astronomy and mathematics.

Italy is seldom thought of as the home of great advance in mathematics and astronomy unless by the few who know the history of these sciences. Even by the well informed it is usually felt that whatever was accomplished by Italians was done in the older time before, as it were, the other nations had a chance to wake up. At all times in history, however, even down to the present, Italy's contributions to these departments of science have been very important. The main difficulty for the writer of Italian achievements in mathematics and astronomy is not to find materials, but to compress the many important details into a chapter that will

not be out of proportion with other phases of the description of Italian accomplishment.

The success of Italian devotion to the exact sciences will be best appreciated from the place of their students in the history of mathematics. It is seven centuries since the great English medieval scientist Roger Bacon said "for without mathematics nothing worth knowing in philosophy can be attained," and even ventured to add "for he who knows not mathematics can not know any other science; what is more he can not discover his own ignorance or find its proper remedy." But it is generally recognized, despite the lapse of time since the English Franciscan's declaration that far from outliving its significance, more than ever mathematics lie at the basis of most of the real progress in the physical sciences and controls and confirms the reality of scientific advances better than anything else. Only those who are especially acquainted with the history of mathematics know how much was accomplished by the Italians, but only a short review of it is needed in order to make it clear that as with regard to other phases of human progress Italy contains the most important focus of mathematical development during many centuries and has practically never been lacking in magnificently successful students of mathematics whose work has facilitated the accomplishment of others.

When the Roman Empire was breaking up Boethius, whose *Consolations of Philosophy* was one of the most used books of the Middle Ages, the favorite reading of Dante, summed up in his *Institutio arithmetica* and his *Geometria* all that was known of mathematics in his time. He had exemplified some of the principles, and he was besides responsible for an improvement in the *abacus*, the apparatus by the aid of which calculations were made.

The books on mathematics attributed to him and especially the geometry have sometimes been said to be the work of another and later hand, but as they are mentioned by Cassiodorus within two generations after Boethius there

can be no good reason to doubt that they were due either to him or some one very close to him and inspired by his work. This is the first great contribution to mathematics due to Italians, but it was followed by many others. Cassiodorus himself in his Encyclopedia gives an important place to mathematics. These two men represented the concluding chapters in the old Roman scholarship.

When the intellectual world of Europe woke up again after an eclipse of academic interest during the migration of nations, Gerard of Cremona and Plato of Tivoli translated a number of the Greek works on mathematics out of Arabic into Latin. This represented the beginning of modern mathematics in the West. Plato of Tivoli, Tiburtinus, as he is according to the Latin form of his name, having heard at the beginning of the twelfth century, of the Arabian knowledge of astronomy, went across to Spain, making what was at that time a long perilous journey which better than anything else showed his ardor for study, to secure a knowledge of astronomy and mathematics. He made, as we have said a series of translations including the *Sphaerica* of Theodosius. At the end of the twelfth century his Italian colleague Gerard or Gherardo of Cremona, Cremonensis in Latin, is said to have translated altogether some seventy books. The hearty enthusiasm of these early scholars and their willingness to make sacrifices of time and labor for the cause of science shows the spirit that was abroad.

They were followed in the thirteenth century by Leonardo of Pisa, sometimes known also by his family name of Fibonacci, who is "one of the greatest geniuses in the history of mathematics" (Cajori). Indeed he went so far beyond his contemporaries that they were quite unable to follow him, and it took several centuries to catch up with him. Every mathematical writer for centuries went back to Leonardo and founded his work on what Leonardo had accomplished. He is best known for his *Liber Abaci* or Book of the Abacus which in the language of the day meant book of calculations. Hankel, the German mathematician of the middle of the nineteenth

century declared that this work "has been the mine from which arithmeticians and algebraists have drawn their wisdom; on this account it has become in general the foundation of modern science." Fink in his *History of Mathematics* mentions a number of improvements, real inventions or original modifications of previous methods, made by Leonardo which indicate his practical genius. "Besides ordinary subtraction with borrowing, he teaches subtraction by increasing the next figure of the subtrahend by one, and is to be regarded as the creator of this elegant method." In the arithmetic of fractions he laid a new foundation by his exercises preliminary to division. He showed how to separate a fraction into unit fractions. "Especially advantageous in dealing with small numbers is his method of determining the common denominator; the greatest denominator is multiplied by each following denominator and the greatest common measure of each pair of factors rejected. He was familiar also with the casting out of the nines for which he furnished an independent proof."

Besides the *Liber Abaci* Leonardo of Pisa wrote a *Practica Geometriae* which indicates very clearly his thorough going mathematical genius. It contains a geometrical demonstration of the area of the triangle as a function of its three sides that is notable at that time, and "all of the problems are treated with skill and Euclidean rigor" (Cajori).

During the disturbances that occurred in Italy in the fourteenth and early fifteenth centuries very little attention was paid to mathematics. There had been a magnificent development during the twelfth and thirteenth, and then came the decadence, apparently so inevitable after a period of marked advance and especially likely to occur in the midst of civil strife such as was brought on by the absence of the Popes at Avignon and the confusion of civil and political government which ensued throughout Italy.

With the coming of the Renaissance however, about the middle of the fifteenth century there was in every other department of intellectual progress a magnificent reawaken-

ing. Along with the arts, literature, scholarship, architecture and education, mathematics had its Renaissance. The first and greatest name in the revival of mathematics was Lucas Paciolo (or Paciuolo) the Franciscan friar who was successively professor of mathematics at Perugia, Rome, Naples, Pisa and Venice, and some of the latter years of whose life was spent in Florence. Italian interest in mathematics in the Renaissance was manifestly not confined to any one city or region but on the contrary existed everywhere. In his first work *Summa De Arithmetica, Geometria, Proportione et Proportionalita*, published at Venice two years after the discovery of America he followed the principles laid down by Leonard of Pisa. He was not an original but a practical mathematical genius to whom is owed the application of algebra to geometry and the first use of symbols, that is of letters to indicate numerical quantities.

Paciolo was a close friend of Leonardo da Vinci and the book ascribed to him on *The Divine Proportion* was written with the co-operation, to some extent at least, of his great contemporary. To Leonardo da Vinci Cantor in his great *History of Mathematics* devotes more than a score of pages, and there is no doubt at all that the great painter, sculptor, architect, scientist and engineer, was also a great mathematical genius, though his intense occupation with many other things kept him from that formal development of his ideas that might have made him as important in the history of mathematics as of art. Above all, Leonardo da Vinci recognized very clearly the truth of Roger Bacon's remark that science, to be certain, must be capable of formulation in mathematical laws.*

* We owe most of our modern knowledge of these older Italian mathematicians to the life long labors and enthusiastic collector spirit of Prince Buoncompagni Ludovisi, whose favorite life study was the history of mathematics. His *Bollettino Buoncompagno* was very well known to the special students of mathematics all over the world and contained numberless papers by the princely editor himself. He spent immense sums of money for various mathematical publications that otherwise might not have seen the light and expended a fortune on his library, which contained over 600 manuscripts and nearly 20,000 printed books. He made it his business to be helpful to mathematical genius wherever he found it and aided many a poor scholar to secure further mathematical training and the opportunity for the publication of his books.

With the sixteenth century came the rapid development of algebra in Italy. In 1505 Scipio Ferro imparted to his pupil Floridas a solution of the equation $X^2 + MX = N$ and also a solution of cubic equations which represented the first step in this direction ever made. A second solution of cubics was made by Nicolo of Brescia, who is better known in history as Tartaglia, the stutterer, because of a defect of speech due to an injury in early life. Tartaglia had worked out a general solution of cubic equations, forced to it by a contest in the solution of problems, the challenge of which he had accepted. Such discoveries were looked upon as inventions in those days, and like the inventions of our time were kept secret for the benefit of the inventor. Tartaglia, however, confided his secret to Jerome Cardan, who though he was bound under the strictest secrecy with regard to it, published it in 1545, and thus precipitated a controversy with Tartaglia over priority. About this time Ferrari solved bi-quadratic equations after Colla had proposed the problem $X^4 + 6X^2 + 36 = 60X$, which he looked upon as insoluble by any mathematical method then known. Ferrari solved it and thus made another step in algebra. Ferrari was a pupil of Cardan's and Cardan's influence meant very much for algebra.

In 1572 Raphael Bombelli published an algebra which summed up the knowledge of that day, disclosing a much better acquaintance with imaginary quantities than might be supposed possible in this time. About the same time Maurolycus of Messina wrote on conic sections in quite modern temper. In the seventeenth century Galileo described and investigated the cycloid curve, which came to be valued for the graceful form which it imparts to architectural details. Nearly two centuries before, Cardinal Nicholas of Cusa, a German who was long under Italian influence, had first called mathematical attention to this curve, having recognized it as the path described in the air by a fly alight on the top of the wheel of his carriage while the wheel went around and the carriage moved forward. Vincenzo Viviani, a pupil of

Galileo, described the tangent to the cycloid. The word abscissa for one of the elements of the mathematics of trigonometrical curves is said by Cajori to occur first in a work of Stefano degli Angeli, a professor of mathematics at Rome. The word ordinate does not occur until Descartes' time, though it is derived from the term *lineae ordinatae* which had been used by the Roman surveyors.

To Galileo we owe the development of the basic principles of mechanics. He anticipated fundamentally Newton's laws of motion. He taught the possibility of various motions being given to a body at the same time and acting independently on it and thus formulated the true theory of projectiles. In the fourth of his *Dialogues on Mechanics* he demonstrated that the path described by a projectile, being the result of the combination of a uniform transverse motion with an uniformly accelerated vertical motion, must apart from the resistance of the air, be a parabola. He went a measurable distance toward the discovery of the third law of motion by his satisfactory definition of momentum and his theory of the inclined plane. He did almost as much for statics as he did for kinetics, and by establishing the theory of virtual velocities laid down the fundamental principle which in the opinion of La Grange contains the general expression of the laws of equilibrium. When to all this is added the fact that he introduced infinitesimals into geometrical demonstrations, thus starting the mathematical world out on the path toward calculus, some idea of his marvelously practical genius as a mathematician will be clear and how great the world's debt is to this Italian scientist in mathematics.

A series of Galileo's pupils added greatly to mathematics at this time. Toricelli, better known for his contributions to physics, worked out the mathematics of the cycloid curve. Viviani, as we have said, discussed the tangent of it and its mathematical significance. Cavalieri, of whom more presently, had been a pupil of Galileo's as a younger man and was afterwards a Jesuit, studied the mathematics of infinitely small quantities and suggested the method of indivisibles

as a contribution to mathematics. Bernoulli, who occupied the chair of mathematics at Padua which had been previously occupied by Galileo, was himself a great teacher of mathematics, and the father and grandfather of the most distinguished mathematical family that the world has ever known. His son was made a member of most of the learned societies of Europe for his contributions to mathematical science. His grandsons taught mathematics at St. Petersburg and at Basel, and were looked upon as among the greatest mathematicians of their time. One of them applied the theory of probability to insurance to determine the number of survivors at a given age from a given number of births. His theory of "moral expectation" as exploited in mathematics attracted a great deal of attention, and is in our time the phase of mathematical development which lies at the basis of actuarial calculations in life insurance.

One of the most important Italian authorities in mathematics is Father Cavalieri, the great Jesuit mathematician, who when scarcely thirty became professor of mathematics at Bologna. He had been just placed in possession of that chair when he stated the principles of indivisibles, though he did not publish his results until 1635. The method of indivisibles rests on the assumption that any magnitude may be divided into an infinite number of small quantities which can be made to bear any of the required ratios one to the other. It represents the first practical step taken toward the formation of an infinitesimal calculus. After this beginning further steps were comparatively easy, or at least naturally to be expected, for the suggestion had been made and development meant only the working out of ideas already involved in the problems as they came up for solution.

There are even some traditions and some solid historical facts for feminine achievements in mathematics in Italy. One of the interesting traditions on the University of Bologna is of a young woman professor of mathematics about the middle of the thirteenth century who knowing her own charms, feared lest they might distract her students from the serious mathe-

MATHEMATICS

matical study in hand, and accordingly lectured from behind the curtain. Curiously enough it is women themselves who have most doubted the truth of this story in the modern time, apparently being unwilling to think that if a young woman were handsome she would be quite ready to conceal her charms behind a curtain. More definitely historical is the story of Maria Gaetana Agnesi who was born in Milan in 1718, and who after a most precocious youth began her monumental work *Le Instituzioni Analitiche*, a mathematical treatise in two large quarto volumes on differential and integral calculus, to which she devoted ten years. She used to become intensely absorbed in her work, forgetting the passage of time and losing track of material necessities such as meal times, quite as Newton did. More than once she solved problems somnambulistically, being surprised to find them done in her own characters on getting up, though when she had gone to bed the problem was still not solved.

Her work was translated into most of the European languages, and its enduring value will be appreciated from the fact that so long as fifty years after its original publication in Italian it was translated into English by the Lucasian Professor of Mathematics at the University of Cambridge. Signorina Agnesi was elected a member by a number of the scientific societies of her time, and especially by the French Academy of Sciences, and won the admiration of and personal friendship of the distinguished Pope Benedict XIV, and was highly honored by the Empress Maria Theresa. She was made Professor of Higher Mathematics in the University of Bologna, but at the very height of her reputation resigned the post to enter a religious order and devote herself to charity. Other Italian women have achieved reputations in mathematics. One of them, Laura Bassi, is mentioned in the chapter on Feminine Education.

In arithmetic the world's debt to Italy is even greater than in any of the other departments of mathematics. Nothing shows so well the practical genius of the Italians as their development of all the processes of arithmetical calculation

that are now so familiar. These nearly all seem so obvious to us now that it is a little hard to understand the world being without them, and yet many of the familiar modes of solving arithmetical problems represent inventions that in their own day were very wonderful. The Italians were the great commercial people of the Middle Ages, with their vessels on the Mediterranean and their travelers in the East, and their trade nearly everywhere, and they were the bankers and the brokers and the medium of interchange between East and West. It is not so surprising then that they should have been the inventors of our modern arithmetical processes, for necessity is ever the mother of invention, but they must be given due credit for what they accomplished. Ball in his short *History of Mathematics* (London, fifth edition 1912) says that the processes of commercial arithmetic were first introduced into Florence in the thirteenth and fourteenth century and have remained practically unchanged ever since. Some of the details of this Italian development of arithmetic are very interesting.

Ball says that "if multiplication was considered difficult in the old times, division was at first regarded as a feat which could be performed only by skilled mathematicians." He illustrates the method commonly employed by the Arabs and the Persians in which a sheet of paper was divided into as many vertical columns as there were figures in the number to be divided. Each figure of this was then taken and by a process of segregation, involving a number of intricate processes requiring a long time for their accomplishment, the division was completed. This method never found much favor in Italy, and our present system was in use there as early as the beginning of the fourteenth century, though the method generally employed was that ordinarily known as the galley or scratch system. The medieval writers were acquainted with the methods now in use, but considered the scratch method more handy. Almost needless to say these two inventions, multiplication and division in our present methods, or such modifications as led up to our present methods, as



GRAND CANAL WITH CAVALLI PALACE, VENICE.

made by the Italians, represent a saving of time and mental energy for mankind that has scarcely ever been surpassed by any human invention.

It was the Italians who arranged the problems to which arithmetic could be applied into different classes such as the Rule of Three, Interest, Profit and Loss, Discount, Longitude and Time and the other similar classifications which have made so much for the simplification of the teaching of arithmetic itself, as well as of arithmetical processes. They also reduced the fundamental operations of arithmetic to seven. Pacioli declares that this was done out of reverence to the Seven Gifts of the Holy Spirit.*

Whatever the reason may have been, the reduction of fundamental operations to "numeration, addition, subtraction, multiplication, division, raising to powers and extraction of roots" represent a thorough simplification of arithmetic, as a practical science. Indian mathematicians, enumerated some 20 principal processes and sometimes a dozen of subsidiary ones, and the Italians were the first to reduce the complex system to its modern simplicity.

It is easy to understand then that with so much of the development of trigonometry and of algebra theirs and with practically all of arithmetic, the world's debt to Italy and to mathematics is very large. The Italians literally accomplished more for this science and especially the great foundations of it than all the other nations put together. We shall find in treating the development of modern astronomy that practically the same thing is true of that subject.

* Writers on the History of Mathematics have sometimes scoffed a little at the reason for this seven fundamental operations but they might as well have laughed at Newton's division of colors into seven for which he had scarcely any better reason. The spectrum as he divided it has however proved very useful in optical problems.

ASTRONOMY

ASTRONOMY practically always runs parallel with mathematics in its evolution, and so it proved in Italy. Modern astronomy began nearly a millenium ago when Italian scholars made a series of translations of Arabic books on astronomy as well as mathematics, which proved the seeds for the development of these sciences in the West. As we have said in treating of mathematics one of the most active of the translators was Plato of Tivoli, to whom we owe the translation of *Albategnius' Astronomy* as well as other astronomical books. Gherardo of Cremona was even more industrious and is said to have made translations of about seventy scientific treatises, including the *Almagest of Ptolemy*. During the thirteenth and fourteenth centuries important original additions to the science were made. Such names as Leonard of Pisa and other Italian mathematical students of this time must be counted in astronomy as well as mathematics. They opened up the field of scientific astronomy in modern times.

Dante in his great poem made significant use of the knowledge of astronomy of his time, which was by no means so vague and indefinite as might be thought. He is the typical university man of his time, and shows how broad must have been the interest of cultured Italians of that period, for Dante wrote for and was eagerly read by his contemporaries. Anyone who thinks that science was neglected or cultivated only by a few rare spirits in the first century of formal university life has not read Dante with care. Alexander von Humboldt, the great German scientific writer of the early nineteenth century, pays a fine tribute to Dante for his love of nature and sensibility to the charms of terrestrial life, as well as for

his scientific knowledge. Dr. L. Oscar Kuhns, Professor in Wesleyan University has in his book *The Treatment of Nature in Dante's Divina Comedia* suggested a comparison between the scientific attainments of Dante and Goethe. Goethe is usually looked upon almost as much as a scientist as a poet. This comparison is particularly apt in all that concerns their knowledge of astronomy. Professor Kuhns says of Dante that "one may confidently assert that no such perfect lines descriptive of the stars have ever been written." Dante declares in his *Convito* that the milky way is composed of a multitude of minute stars, and there are many other astronomical details of information often supposed to be of much more modern acquisition.

Dante knew thoroughly the Ptolemaic system of astronomy. He refers to the eclipses and their causes, has many references to comets and to shooting stars which he knows to be most numerous in August, and presents constant and accurate allusions to the constellations in their various shapes and positions in the heavens. The hour of the day and the season of the year are often referred to in terms of astronomical science. Dante's teacher was Cecco D'Ascoli, who was not only an astronomer but a scientist in many other departments. Dante has used his scientific knowledge more effectively to illustrate his poetic meaning than any poet of the succeeding centuries down to our own time, and may well be compared to Tennyson for his employment of details of scientific information to illuminate his deeper meanings as to the problems of the universe. Dante's many scientific allusions are above all interesting, as showing how deep must have been the interest of Italians of the fourteenth century in everything scientific.

Astronomy had a period of decadence in Italy from which every form of intellectual life suffered in the later fourteenth century, but at the end of the Middle Ages and the beginning of the Renaissance there was a revival. The first great name in modern astronomy is that of George Purbach of Vienna. His life was spent in the Teutonic countries,

but through the inspiration of Cardinal Bessarion he realized how much of value it would mean for him to study in Italy for the sake of mathematics, and above all because of the opportunities afforded by Italian collections to consult *Mss. of Ptolemy* in the original instead of in the round about versions from an Arabian commentary. He died before he could put his purpose into effect, but not before he had made arrangements for his pupil Johann Müller, subsequently known by the Latinized form of the name of his birthplace, Königsberg as Regiomontanus, to have this Italian experience. Altogether Müller spent seven years in Italy and laid the foundation of our modern astronomy. After having subsequently worked in Vienna and in Nuremberg he was called to Rome again in order to correct the Calendar, but unfortunately died there at the early age of forty before his task had been completed. Cardinal Nicholas of Cusa, also a German, who did much of his work in Italy, was a patron of Regiomontanus. Cusa's books, while he was the particular friend of many Popes, familiarized men's minds with genuinely scientific astronomical ideas. He taught that the earth was not the centre of the universe, was not without motion, and must be considered as one of the stars in the heavens. Leonardo da Vinci about the end of the fifteenth century pointed out that when the moon was nearly new, the half of the earth which was then illuminated by the sun was turned nearly directly towards the moon, and that the moon was in consequence illuminated slightly by this earth shine just as we are by moonshine. This accounts for the dim illumination seen over the rest of the surface of the moon when the bright part is only a thin crescent. No wonder with all this of interest in astronomy that towards the end of the fifteenth century Copernicus went down to Italy in order to study mathematics and Astronomy with Novaro at Padua, then looked up to as the greatest of mathematicians alive. During all his subsequent life Copernicus evidently looked back with grateful good will for his Italian experience. When he had prepared the first sketch of his great theory he sent it to Rome

to be announced there, and his theory was first publicly taught there to large, and he it said so far as tradition goes, enthusiastic audiences. Just before his death he dedicated his great life work to the Pope. All his life he had been in rather intimate relations with Italian ecclesiastics, and exchanged letters with many of the student friends whom he had met in Italy.

The work that began so interestingly in the later fifteenth century was destined to bear fine fruit in the following centuries. Fracastorius in the first half of the sixteenth century pointed out that comets' tails constantly point away from the sun as the comet changes its position. A series of Italian students of astronomy kept alive the interest of the science until with the coming of Galileo, in the early seventeenth century, it was to receive its greatest impetus in history.

Galileo was by the universal accord of all historians of science probably the greatest of observational astronomers of all time, but he was even much more than this. Trouessart said "In science we are all disciples of Galileo." David Hume said "Bacon pointed out at a distance the road to true philosophy, and few realize how great the distance from which he pointed it out. Galileo both pointed it out to others and himself made considerable advances in it."

He was only eighteen when he noticed the synchronous character of the pendulum swing. Though when he was twenty-one poverty compelled him to quit the university without taking the regular course so as to receive his degree, he spent the next four years intensely and successfully occupied with scientific subjects. When he was twenty-two he wrote a scientific essay on an instrument which he had invented called the hydrostatic balance. In 1604 when he was thirty he made his first great astronomical discovery. When he discovered a new star in the constellation *Serpentarius*, he proved that this star was more distant than the planets, and thereby confirmed Tycho Brahe's discoveries along the same line. He demonstrated besides that there were changes taking place in the universe outside of the solar system. A

few years later he invented the telescope, not being the first to do so, and perhaps obtaining the hint for it from rumors that had reached him from the Netherlands, though certainly without any definite description of the instrument to guide him. "While perhaps a little later than Harriot in making astronomical observations the credit of first using the telescope is to a great extent justified by the persistent way in which he examined object after object whenever there seemed any reasonable prospect of results following, by the energy and acuteness with which he followed up each clue, by the independence of mind with which he interpreted his observations, and above all by the insight with which he realized their astronomical importance." (Berry, *Short History of Astronomy*.)

His telescopic studies on the moon were epoch-making. He even ventured to calculate from observations the height of some of the more conspicuous lunar mountains, the highest being estimated by him to be about four miles in altitude, a result agreeing closely with modern estimates of the greatest height on the moon. He thought there was water on its surface and demonstrated that the moon was in many respects similar to the earth, but he noted the absence of clouds. His telescope also revealed to him many stars never seen before. He saw thirty-six stars in the Pleiades where the unaided eye sees but six. The Milky Way and various nebulae were now demonstrated to consist of a multitude of faint stars clustered together. Before this men had reached this truth by reasoning about them. The most important discovery however, was that of the moons or satellites of Jupiter, made in January, 1610. He demonstrated that they revolved around the planet and estimated with a fair approach to accuracy their periods of revolution, ranging between forty-two hours and seventeen days.

Before the end of the same year Galileo had observed that the planet Saturn appeared to consist of three parts; also that Venus which to the naked eye appears to vary much in brilliancy but not in shape, was in reality at times crescent

shaped like the new moon, and passed through phases somewhat similar to those of our moon. This showed that Venus was, like the moon, a dark body in itself deriving its light from the sun; so that its similiarity to the earth was thereby made more evident. The discovery opened up the problem of possible inhabitants on the other plants. The recognition of the dark spots on the sun was the fourth important ground breaking discovery of this single year, 1610. By observations made on these he demonstrated the rotation of the sun. During the following years he made application in many ways of his discoveries. He suggested for instance that observations on Jupiter's satellites might be used as a standard for time. Even at the end of his life he discussed the question of the moon, always presenting the same face to us, and by very careful observation succeeded in discovering what we now know as the librations of the moon, though he had not quite completed his demonstration of them when failing sight culminated in blindness.

The idea that about this time astronomy was in any sense of the word a forbidden subject or even an object of suspicion on the part of ecclesiastics that hampered its progress, in Italy, is an idea due entirely to a perversion of the significance of the Galileo case, which is completely negatived by the fact that two distinguished German students of science who did much for astronomy about this period were invited to Rome at this time, and did their work there for years. One of these was Christopher Scheiner, whose studies on the sun have made him famous, and who was the first to describe sun spots. He also observed their rotation and the appearance of the faculae. He wrote an important work on the Sun called *Rosa Ursini* which was published in Italy, and he became Professor of mathematics in Rome. The other was Father Kircher who wrote several books on astronomy, devised an instrument to demonstrate for class teaching the movement of the heavenly bodies, and was deservedly looked upon as one of the greatest scholars of the time, as we have pointed out in the chapter on Physical Science.

The next great Italian astronomer after Galileo and his immediate contemporaries, was Giovanni Domenico Cassini (1625-1712) who discovered the rotation of Jupiter, of Mars, and of Venus in successive years after 1665 and made the tables of the motions of Jupiter's moons, 1668. He was then invited to Paris as Astronomer Royal, where he discovered four new satellites of Saturn and the dark marking in Saturn's ring, which has come to be recognized as a division of the ring into two, and is since known as Cassini's division. He made significant additions to the current constitution and movements of the sun and calculated a fresh table of atmospheric refraction. At his suggestion John Richer undertook a scientific expedition to Cayenne, where the observation of the position of Mars in the sky combined with those made by Cassini and others in France led to a reasonably accurate estimate of the distance of Mars and hence that of the sun. Cassini calculated the distance of the sun as about 360 times the distance of the moon, nearly 90,000,000 of miles. Cassini's descendants succeeded him for three generations at the French observatory while several members of the Maraldi family into which his sister had married worked in co-operation with their cousins. They made a number of planetary and other valuable observations, but mainly illustrate how easily science falls into a rut, for they were slow to accept the great discoveries being made around them.

Italians continued to be shining lights in astronomy in the eighteenth century and one of the greatest astronomers and mathematicians of this time, Boscovich, was on the paternal side of distant Slav origin, but his given names, Ruggiero Giuseppe are thoroughly Italian. He was born in Dalmatia, but educated entirely under Italian influences and lived all his life in Italy. He was a Jesuit, but his esteem in the scientific world may be realized from the fact that he was made a member of the Academies of Bologna, Paris and London and received many invitations to become professor at foreign universities. He wrote some sixty-six treatises altogether and was looked upon as one of the most important

contributors to science in his time. For nearly fifty years his work was done in Italy, and after the suppression of the Jesuits he accepted an invitation to become Director of Optics for the Marine, a new office created especially for him in order to secure his services for France. He was preeminent among the scholars of his time, was recognized as one of the pioneers in science, the inventor of important instruments which are still employed, such as the ring micrometer, and as a most prolific writer on the most important subjects of mathematics and the physical sciences related to astronomy as well as in general philosophy.

During the nineteenth century a series of very important discoveries were made by the Italian astronomers. The century had scarcely opened when on the first night of January of the year 1801, Father Piazzi engaged in making star maps found a heavenly body of the eighth magnitude, which on repeated observations proved to shift its position. He thought at first that it was a comet, but it proved to be a planet with an orbit between Mars and Jupiter. Keppler and Bode had called attention to the apparent gap between these two planets, and this made the discovery of great importance. Six hundred of these small planets have since been located in this same space in the heavens. Besides this discovery Piazzi published a series of star catalogues, that of 1814 containing observations on 7,646 stars. Prizes were awarded to these catalogues by the Institute of France, and they undoubtedly represented a magnificent advance over all preceding star maps and catalogues. Piazzi corrected errors in the estimation of the obliquity of the ecliptic, of the aberration of light, of the length of the tropical year and the parallax of the fixed stars. He is a worthy Italian colleague even of such great contemporaries in other countries as Sir John Herschel.

A series of Italians, some of them clergymen, attracted attention for their astronomical work during the nineteenth century. One of the first to whom Piazzi sent the account of his discovery of the new planet was Father Oriani, the director of the Milan Observatory. Though born in the humblest

circumstances and in his boyhood a mason's apprentice, Oriani through the Barnabite Order obtained the opportunity for an education. For fifty-two years he contributed largely to the *Effemeridi* of Milan. His observations on the planet Uranus gave him a place among the astronomers of all times. He was looked upon as an authority and was made a Count by Napoleon, received the Legion of Honor, and was given the duty of measuring the arc of the meridian between Rimini and Rome. Some of his work in mathematics also has attracted attention.

Inghirami was another Italian clergyman who attracted attention in astronomy. He was selected by the Berlin Academy to do a portion of its map of the celestial equator. Encke, the Prussian Astronomer, declared Inghirami's execution of the part assigned him — one of the most difficult of all — as perhaps the best accomplishment of the great undertaking. Denza, another Italian of this century, was one of the founders of meteorology. He made a series of thorough scientific observations and aroused interest in the new science. He succeeded in covering Italy with a net work of 200 weather stations which provided the model for other nations. He became the director of the Vatican Observatory and occupied himself with the photography of the heavens. This Observatory was chosen with seventeen others to execute an international photographic map of the heavens.

Santini whose successful prophecy of the time of the return of Biela's comet gave him a popular reputation, had acquired high esteem from his astronomical colleagues by his catalogue of the stars between the tenth degrees north and south latitude, and his calculation of the paths of some seventeen comets. Secchi did work that attracted world attention in both astronomy and meteorology. He invented self registering meteorological instruments which are in principle at least used all over the world at the present time, and for which he received prizes from the French exposition. He is best known for his epoch making work on the physical constitution of the sun and the stars. He applied the spec-

troscope to the investigation of star light and studied altogether 6,000 stars. He made most delicate observations on the sun's protuberances and sun spots and exact measurements on over 1300 double stars. He wrote so many papers containing valuable observations that Rospigi said of him that "his industry resembled rather the activity of a scientific society than of an individual." He wrote sixty-five independent works and monographs and some 42 scientific periodicals contain literally hundreds of his shorter papers.

Father Secchi's epoch-making achievement was the discovery of what are known as the five Secchi type of stars deduced from about 4,000 spectra of stars, on which he had been at work for some twenty years. The unexpected discovery that all fixed stars may as far as their physical chemistry can be determined by the spectroscope be reduced to a few types, seemed to many an accomplishment of as great significance as any that had ever been made in astronomy. The theory of the unity of the world and of the identity of the fixed stars and the sun from a material standpoint received profound scientific demonstration. His observations on the sun brought him many distinctions and opened up new chapters in the knowledge of that important body. His studies of the moon, of the double stars and of the planets, all have a very important place in modern astronomy, and some of them have been taken as the basis of further work by subsequent astronomers.

One of his great Italian colleagues was his teacher, De Vico, well known for having six times won the gold medal offered by the King of Denmark, as the first discoverer of a telescopic comet and by his observations on Venus, and his important discovery that the spots on the planet could under the Italian sky be observed in the day time. Political troubles after the Revolution in 1848 sent him into exile from Italy because he was a Jesuit, but he received an honorable welcome in France and England and was given important astronomical commissions by foreign governments.

In every century since the beginning of the twelfth, when

Plato of Tivoli made the long, difficult journey to Spain to obtain from the Arabs a knowledge of astronomy and mathematics which they possessed as the result of their direct contact with the old Greek authors in the still Grecian cities of Asia Minor, down to our own day, either Italians themselves have made significant additions to both of these disciplines, or else men who had been educated in Italy and who were quite ready to confess that they owed their intellectual ability and power of achievement in these exact sciences to their Italian teachers have made great advances. This constitutes a chapter in Italy's intellectual achievement that is often not well understood, and is very seldom known in anything like its real significance. It really constitutes one of the most important chapters in the history of human intellectual development in modern times.

PHYSICAL SCIENCE

WHILE the Italians, as we have just seen, have been so prominent and so thoroughly original in their productiveness in mathematics and astronomy as probably to surpass any other single nation in the significance of their contributions to these important modes of human knowledge, they have been scarcely, if any, less notable in their achievements in the physical sciences generally. Ordinarily it is presumed that physical science did not develop to any great extent until comparatively recent times, but in this, as in every other department of science the more careful study of history in recent years has made it very clear that men have at many times devoted themselves successfully to the solution of scientific problems and have worked out, some at least, of the principles underlying them. A great many people would have the feeling that physical science is so modern that the Italians could count for very little in it, not so much through any direct fault of theirs, as because they did not have the advantage of primacy in the intellectual world when science came into its own and reached a definite phase of evolution. As a matter of fact the history of physics in Italy is an extremely interesting chapter in the story of science.

The old Romans are sometimes said to have been ignorant of such principles of hydrostatics as that water seeks its own level, and consequently were compelled to build the immensely expensive aqueducts, the remains of which are still to be seen on the Campagna in order to carry water into the city. There is ample evidence, however, for their knowledge of this scientific principle, but the difficulty in securing a water supply which they had to encounter, lay in the inability of

that time to construct such water carrying devices as would enable them to take advantage of it. Hence they solved their practical problem of securing a city water supply by the erection of the magnificent aqueducts which, treated in fine architectural spirit, became the beautiful adornments of the landscape which they still remain, in spite of the vicissitudes of time.

In the making of glass and above all tiles of various kinds which we have in recent years labored to imitate, and not always successfully, in the manufacture of colors many of which have proved more enduring than any that we can make, in the decoration of pottery as well as in ever so many other phases of the arts and crafts, the Romans showed that they had solved many chemical and physical problems for which at least a practical knowledge of scientific principles is required. Wendell Phillips in his oration *The Lost Arts* has called attention to some things the Romans could do that we are not able to accomplish in our time with all our knowledge of physical science.

The interest manifested by many of the Romans of the early empire in the problems of nature shows that physical science was not foreign to the Roman disposition. To name but Celsus and Pliny we have two writers whose works have always deservedly attracted attention because of their compilation of scientific information. What Humboldt did in our time in his *Cosmos*, Pliny had tried to accomplish in his *Naturalis Historia* during the first century. It is to him that we owe the term Natural History, so commonly used until our time when some scientists began to object to it. He lacked the definite information of the modern time, but he had the breadth of interest, was an immense reader, and even in certain ways proved himself an original observer. His story of certain intermittent springs in Italy and his death while venturing too near Vesuvius during an eruption in order to make personal observations, are ample proof of this. His second book treats of earth, stars, meteors and such terrestrial phenomena as earthquakes, the elevation of islands

and so forth, and the next three books are geographical. The next twenty books are devoted to biology, but then there are a series of treatises on the metals, on precious stones and on the different kinds of stone and marble. This was, however, compilation and while not science, in our acceptance of the term, we must not forget that we have limited its application until a reaction against our use of it seems imminent.

It is probably true to say that the first genuine contributions to physical science in Italy came in connection with the development of what they termed the science of cosmology by the scholastic philosophers. Such men as Anselm, Peter Lombard and Aquinas, to mention only the greatest names in what might be made a rather long list, writing commentaries on Aristotle made a series of speculations with regard to matter and its qualities, which represent positive basic principles in physical science. These speculations were founded on comparatively few observations and a great many assumptions, but at least they had the advantage of Aristotle's knowledge of physics and their thinking was modified by much more of actual observation than has usually been supposed. The conclusions they came to are interesting because they foreshadowed very clearly a number of doctrines that were arrived at by our most exact observation in physical science during the nineteenth century. Indeed, the extent to which they anticipated some of the very latest conclusions of modern science is rather startling to those who have not had their attention called to it before.

They taught very distinctly for instance what is the most recent teaching of physical chemistry that all matter had an underlying basis the same in all material things, though differentiated into various substances by certain superadded qualities. In accordance with this teaching all matter was composed of two principles, one of which was dynamic termed "form" and the other material, termed *materia prima* or "prime matter." This was the teaching of Aristotle, but they developed it notably and applied it very concretely. According to this teaching prime matter was the same in all

material substances, while the different kinds of matter as we know them were differentiated by certain dynamic qualities or *forms* joined to this prime matter. The scholastic philosophers did not think as did most of the scientists of the nineteenth century that there were a number of essentially different kinds of matter so-called elementary substances. They felt that all the various substances had the same substratum, but with distinctive qualities dependent on the force elements in them. Once this is understood it is not surprising to find that the scholastics, in spite of the obloquy that has unfortunately gathered around that term, taught as definite truths the indestructibility of matter and even the conservation of energy. Matter might change in its mode of being, but could not disappear and even its dynamic qualities might be modified, but neither would these disappear, and they represented the sources of energy as we know them. When Aquinas declared, as he did in his lectures at the University of Paris (1270) *nihil omnino in nihilum redigetur*, "nothing at all will ever be reduced to nothingness," he was teaching the indestructibility of matter as well as of energy.

As a matter of fact just as soon as our modern science tries to lift itself above the mere accumulation of information into the realm where it thinks out the significance of its observations, it is almost sure to find out that distinguished Italian thinkers of the olden time have anticipated some, at least, of the conclusions that it seems forced to draw.

It was not until the Renaissance however, that physical science properly so-called came into existence as one of the disciplines of human thinking. One of the first who became prominent in history as a physicist in our sense of the word was Toscanelli, the son of a physician and himself in his early years following the profession of his father. He was a close personal friend of Regiomontanus and Nicholas of Cusa, and his interest in astronomical and mathematical questions was constantly kept up. He made painstaking and exact observations of a series of comets and constructed the well known gnomon of Santa Maria del Fiore at Florence, by the

shadow of which he could determine mid-day to half a second, and could settle with precision the altitudes of the solstices. He became the centre of scientific interest in his time, and the friend and advisor of the greatest scholars of Italy and of other countries. This wide influence was to be of very great value to the world when the question of sailing westward in order to get to the other side of the globe began to be bruited.

There is a well authenticated tradition which has rather been re-established than in any way disturbed by recent controversies, that Toscanelli's tentative chart of the Western Ocean greatly encouraged Columbus, and above all made many of those with whom Columbus came in contact feel that the Italian adventurer who wanted to secure the opportunity to sail westward was after all not such a dreamer as he seemed to be at first. Toscanelli had insisted with the Portuguese for a considerable period that instead of going around Africa as they had been trying to do for half a century, they might by sailing westward, find a shorter voyage and a less stormy route. Toscanelli's knowledge of the geography of his time was as thorough as could be, and he may well be looked upon as the founder of cosmography, the branch of science which aims to secure knowledge of the world in every detail. Toscanelli had interested himself also in meteorology, and though his writings unfortunately have not been preserved, the title of one of his books *Meteorologia Agricola, The Science of the Heavens for the Farmer* would seem to indicate how thoroughly practical Toscanelli's scientific observations usually were.

To many it would seem as though these earlier speculations and even scattered observations in physical science meant very little for true scientific development because as yet the foundation stone of physical science, the inductive method had not been well laid. Some seem even to think that the world had to wait for Francis Bacon to lay this before any real structure of science could be built up. Long before Francis Bacon, however, the question of inductive science had been thoroughly discussed. Even his great namesake,

Roger Bacon, the Franciscan Friar of the thirteenth century painted out very clearly the significance of the inductive method. In the century before Francis Bacon, Bernardino Telesio, the Italian philosopher, stated very fully the value of induction and recognized all its possibilities. In *Science*, for December 19, 1913, Professor Carmichael said of him:

“He (Telesio) abandoned completely the purely intellectual sphere of the ancient Greeks and other thinkers prior to his time and proposed an inquiry into the data given by the senses. He held that from these data all true knowledge really comes. The work of Telesio, therefore, marks the fundamental revolution in scientific thought by which we pass over from the ancient to the modern methods. He was successful in showing that from Aristotle the appeal lay to nature, and he made possible the day when men would no longer treat the *ipse dixit* of the Stagirite philosopher as the final authority in matters of science.”

The books of that universal genius Jerome Cardan and notably his *De Subtilitate Rerum* and *De Varietate Rerum* contain a series of speculations which are very interesting in the light of modern scientific development. They show for instance that the ideas of evolution which had been expressed in the preceding century by Leonardo da Vinci, were still insistently presenting themselves to the minds of original thinkers. Cardan was quite sure that all creation was in progress of development and he declared very definitely that all animals were originally worms, or very small living creatures of simplified structure. He extended his idea of evolution, however, to the physical world and taught that even the non-precious metals must be accepted as efforts of nature to produce gold and steps in the way of nature's progress toward that goal. Now that our physical chemists are ready to declare that they would like to remove all the silver from a large quantity of lead ore and leaving it aside come back after years to see if they would not find further traces of the precious metal, for they think that silver is constantly being manufactured by radio activity in the



CATHEDRAL, BAPTISTRY, AND LEANING TOWER, PISA

midst of plumbiferous ores, as probably gold is in all copper ore, this expression of Cardan becomes very interesting as an anticipation of what is most modern in physical science.

If after the Renaissance Italy had given the world of science nothing but Galileo the debt of civilization to her in the physical sciences would indeed be great. There is scarcely a department of physics so-called to which the great Florentine did not make magnificent contributions. He was but twenty five years of age when he made the remarkable series of experiments by which he established the first principals of dynamical science. He used the leaning tower of Pisa to give the professors and students of the University an ocular demonstration of the falsity of the notion, which seems almost inborn in human thinking, that heavy bodies fall with velocities proportional to their weight and thus began the modern study of gravity. He was the inventor of the thermometer and greatly improved the telescope and showed how it should be used. His contributions to astronomy are dwelt on in the preceding chapter. His teaching of such principles as that gravity and levity are relative terms and that all bodies even the invisible gases have a certain weight, that weight is a continuous force attracting toward the centre of the earth, that in a vacuum all bodies fall with equal velocities and that the inertia of matter implies the continuance of motion as well as the permanence of rest are all revolutionary and fundamental in mechanics. He taught besides that the heavenly bodies are composed of matter like that on the earth equally corruptible and probably closely related.*

One of the great successors of Galileo among Italian contributors to the physical sciences is Toricelli the quality of whose contributions to science may be well appreciated

* The interest in Galileo and his work down even to our own time and the feeling that what he wrote is always classic, that is valuable to students, will perhaps be best appreciated from the fact that a national edition of Galileo's complete works is now being issued in Italy under the editorship of Professor Antonio Favaro of Padua. The Dialogues Concerning Two New Sciences have been translated into English by Henry Crew and Alfonso de Salvio of Northwestern University. It is probable that after the publication of this national edition of Galileo in Italy new translations of most of his works will appear in many of the modern languages.

WHAT CIVILIZATION OWES TO ITALY

from the fact that though he died before he was forty his name has an enduring place in the history of science. He was distinguished first in mathematics and because of his successful devotion to certain problems that had interested Galileo was brought in contact with the great Florentine scientist. After Galileo's death Toricelli was prevailed upon to remain at Florence and to succeed Galileo at the Academy. It was while here that he invented the barometer and corrected the old idea that "nature abhors a vacuum." The Toricellian Vacuum, obtained by a column of mercury in a tube being allowed to fall until it is just supported by the outer air, is still employed for the purpose of getting a very high vacuum. Toricelli was also very much interested in lenses and constructed a number of microscopies which made microscopic work ever so much easier than it had been before and encouraged workers in the biological sciences to use this instrument with confidence.

Between Galileo and Toricelli in the history of science comes the name of Castelli the pupil of the one and the teacher of the other. He was a Benedictine monk who later was made an Abbot, but about 1623 Pope Urban VIII invited him to Rome and appointed him Chief Mathematician to the Pope and Public Professor of Mathematics in the University of Rome. While in this position he was often consulted by the municipalities of Italy in connection with drainage, water supply, the prevention of floods and the like. His important work "On the Mensuration of Running Water" was translated into most of the modern languages and has been reprinted a number of times. He made a number of discoveries in hydraulics and developed the important relations that the speed of a current varies inversely as the area of its cross section and that the discharge from a vessel depends on the depth of the tap below the free surface of the water. According to Poggendorf, Castelli was the first to suggest the use of darkened lenses in order to make continuous studies of the sun possible with-

out injury to the eye and he is besides the inventor of the instrument known as a helioscope.

While the Italians did so much for mechanics and hydrostatics their most important contributions to physical science were in the department of optics. To Leonardo da Vinci is usually attributed the invention of the simple camera obscura without a lens. Giovanni Battista de la Porta is said to have added the lens making the apparatus complete. He is also said to have invented the opera glass, though it must not be forgotten that Pliny mentions a glass used by Nero to bring the figures in the amphitheatre nearer to him. The stereoscope was invented in Italy and the magic lantern is usually attributed to Father Kircher who spent most of his active fruitful scientific years in the study and teaching of science in Italy. The telescope if not invented by Galileo was at least greatly improved by him and most of the improvements in the microscope which brought it to be the valuable instrument that it is at the present time came from the Italians. The oil immersion lense which made it possible to use lenses with much higher powers successfully is, as noted in the chapter on Inventions, an Italian invention. They began the work, constantly putting the world in their debt by further developments in this department as well as by the discovery of principles that made for a better understanding of light and its phenomena.

Italian interest in science in the seventeenth century can be most readily appreciated from the series of text books in the various departments of physical science issued by Father Kircher then teaching at the Roman college. There is scarcely a department of physics with regard to which Father Kircher did not publish a large magnificently illustrated volume. One of the most important of these was his volume *Ars Magma Lucis et Umbrae* which was illustrated by many original experiments and demonstrations. He constructed a large burning glass in order to demonstrate the story told of Archimedes that he had succeeded thus in setting the Roman ships afire in the harbor of Syracuse.

Two of his treatises are on magnetism and the second one *De Arte Magnetica* is one of the landmarks in the history of this science for in it the word *electricity* (*electricitas*) first occurs. Five years after his book on light he published a book on sound under the title *Musurgia Universalis* with the sub title The Art of Harmony and Discord. Some five years later appeared a treatise on astronomy and then another *Mundus Subterraneus* which treated of mineralogy, metallurgy and the chemistry of metals as well as other subterranean phenomena.

These are not brief treatises nor small manuals, handy text books for schools, but are large quarto volumes magnificently printed and illustrated and now commanding high prices at auction rooms and book sales because of their fine bibliographic qualities. These were the books used very commonly by the teachers of science in the higher schools and colleges of Italy and monastic training schools particularly were seldom without them. No other such series of scientific books summing up the state of science at a given time has ever appeared anywhere in the world. They owed their appearance to the encouragement given Father Kircher in his Italian environment.

Probably the most important phase of Italian contribution to the development of physical science is to be found in that branch of it which developed the latest. If there is anything that shows very clearly that Italy's genius for original observation in science is not a thing of the past but on the contrary is thoroughly up-to-date it is the story of Italian contributions to the evolution of magnetism and electricity. Two of the most important modes of electricity, Galvanic and Voltaic, were by the International Congress of Electricians that fixed the terms of their science, called after the Italians who did so much to open up in a practical way the modern science of electricity. Even before Galvani and Volta had begun their great original work however, there were distinguished contributors to this science among the Italians. For his work in magnetism and electricity the

Abbe Beccaria was made a member of the Royal Society of England shortly after the middle of the eighteenth century. Priestley, himself the discoverer of Oxygen, in his *History of Electricity* issued shortly after Beccaria's election as a Fellow of the Royal Society in 1775 calls him "one of the most eminent of the electricians on the Continent" and describes his experiments on air and water which he says were arranged "in a pleasing and satisfactory manner" as we would now say very ingeniously. Professor Chrystal the Professor of Mathematics at the University of Saint Andrews in his history of the development of electricity in the *Encyclopedia Britannica* (IX edition), has expressed his admiration for Father Beccaria's work and above all how much his incentive meant for the world of science of that time.

The two great founders in modern electricity, however, are Galvani and Volta. Galvani found by his experiments that the contact of metals produced muscular contraction in the frog. At once the thought that electrical force was in some very intimate way connected with vital force suggested itself and a question was opened as to the relations of the two modes of energy that is not yet decided. Volta opposed the notion of the identity of the forces and the world took sides for and against the two Italians. Galvani was an anatomist and not a student of physics, but he had the genius to be able to take advantage of the happy accident of seeing a frog's legs twitch. It was such another fortunate incident for science as Newton's seeing the apple fall, or Lord Kelvin's recognition of the weightless arm for an indicator that a beam of light might be when his eye glass fell from his eye, but millions of people had seen such events before and failed to benefit by them. A few years later Volta invented the Voltaic pile by which a continuous current of electricity might be obtained through chemical means. This was the beginning of applications of electricity for industrial purposes and it has been well said that the invention of the Voltaic pile is now proving to have been a

more important mechanical advance for man in controlling energy than that of the steam engine.*

The work of the great Italians of the end of the eighteenth century was continued during the nineteenth. Nobili invented the thermoelectric pile which Melloni applied to the measurement of very small differences of temperature thus enabling him to evolve the dynamical theory of heat. At the end of the century Marconi taking the observations and discoveries that had been made by a series of men for a generation put into practical form the use of electrical waves in the ether for wireless telegraphy. Probably no greater or more useful invention than this has ever been made.

In another department of physical science an Italian scientist of the nineteenth century the well known Luigi Palmieri, who in 1843 invented magnetic electric apparatus for the demonstration of terrestrial magnetism, secured deservedly a world reputation. In 1856 he was selected as the director of the observatory which King Ferdinand II had erected for volcanic observations on Vesuvius and here for a generation he was brought in intimate contact with every important scientist who visited the crater. For forty years he devoted himself to ardent and successful researches on meteorology and the outbreaks of volcanos. He invented a series of instruments for the measurement of earth tremors, for the estimation of the velocity of the winds, and the tension of the electricity of the air as well as various mechanical applications for the investigation of other phases of physical science. He did not hesitate to expose his life on many occasions in making his observations on Vesuvius

* A very curious early anticipation of some modern ideas is the story of the sympathetic or magnetic telegraph. At the beginning of the seventeenth century an Italian Jesuit, Father Strada had described in a Latin poem how two friends by means of magnetic needless on dials had been able to communicate with each other by moving the magnetic needles to the various letters when the corresponding free swinging one would repeat the moves at a distance. The idea had been even at that time in the air for a considerable period. It is usually attributed to Cardinal Bembo, the elegant scholar and private secretary to Pope Leo X, but it was his friend Porta, the versatile philosopher who made it widely known by the vivid description which he gave of it in his celebrated work on Natural Magic, published at Naples in 1558. Cabeo in his *Philosophia Magnetica* in 1629 gives a picture of the dial of the sympathetic telegraph. Men were naturally quite taken with the idea and it became a favorite subject for popular stories and imaginings.

when in eruption. His book on atmospheric electricity has been translated into several European languages and his observations on Vesuvius are known by every scientist interested in volcanic eruptions. He did important fundamental work in all these departments.

Even in chemistry, the great fundamental discoveries in which are usually supposed to have been limited to France, England and Germany, there is at least one great name forever famous. This is Avogadro, who in 1811, noting that equal variations of temperatures and pressure produce in all gasses and vapors the same change of volume, enunciated what has since been known as Avogadro's law. All in all there are more names of Italians attached to important phases of discoveries in the physical sciences than of any other nation. I have only to mention Galileo, Toricelli, Galvani, Volta and Avogadro as the evidence for this. These names alone provide a very definite demonstration of the immense debt that civilization owes to Italy in the department of physics.

BIOLOGICAL SCIENCES

AFTER the names of such distinguished discoverers in physical science as Galileo, Toricelli, Volta, Galvani to say nothing of others who might well deserve to be mentioned, are recalled, the world's debt to Italy in this department is easy to appreciate. In spite of the contradiction of prevalent impressions as to Italy's lagging in science, there is likely to be, even in the minds of those familiar with things scientific, a feeling that it is probably because of lack of interest in the biological sciences that Italy's scientific deserts have failed of recognition. On first thought I suppose that most people, even many who think themselves quite familiar with the development of the biological sciences, would be inclined to believe that Italy has done very little in this department. Here, as elsewhere, however, only a little investigation of actual scientific history is needed to show that Italy was a leader in this, as in other departments. It so happens that in recent years, that is during the past two or three generations most of the great discoveries in the biological sciences have come from the western nations of Europe, though by no means to the exclusion of Italy. Before that time, however, all the world looked to Italy for initiative and enterprise in biology, as in all the other sciences, and for seven centuries there was scarcely any period when Italy did not possess the leading thinkers and discoverers in the biological sciences.

Indeed the story of the work done in the Italian peninsula for biological science when told, even in the brief detail that is possible here, is one of the most glorious

chapters in the whole history of science. Italy presents a long role of men famous for discoveries and diligent investigation in biology, whose names the scientific world at least will never willingly let die. Besides what is owed to Italy for actual discoveries in biology and for the encouragement of biological studies, the world's debt to Italy is very large because of what was accomplished for education in the biological sciences in the peninsula. A great many of the biological scientists of other countries owe their education to Italian universities or confess to having been deeply influenced by Italian scientific workers. Though the word biology was first used only at the beginning of the nineteenth century the ideas underlying it have been the subject of study ever since man began to make observations and draw conclusions as to the living things around him. The basic sciences of biology are anatomy and physiology and the two men whose names are associated deservedly with the foundations of these, Vesalius and Harvey, though neither of them Italian were both students of Italian universities and acknowledged their deep obligations to their Italian masters.

To take first anatomy, the foundation stone of the sciences in the biological group, the first great teacher of anatomy and modern science was Mondino (Latin Mundinus) who was professor of anatomy at the University of Bologna at the end of the thirteenth century and who wrote a manual for students arranged so as to be an aid for the practice of dissection. This became the standard handbook for this purpose for several centuries. It is extremely limited in scope but its one merit is that it encouraged actual observation and the practice of dissection rather than the fine-spun elaboration of theory and the dependence on mere book learning that had been the custom. For centuries, indeed until our own time the dissecting room offered the only opportunity for regular laboratory work in the biological sciences. The laboratory is important not only for the information it imparts, but for the scientific method which

it cultivates and the habits of observation which it forms. This work and its place in science we owe to Mondino of Bologna.

Mondino's assistant, a young woman Alesandra Giliani by name, is said to have invented a mode of injecting bodies for preservation for anatomical purposes and this greatly facilitated the development of the nascent science. For the next two centuries all the impetus for the study of anatomy came from Italy. Guy de Chauliac, the great French surgeon, well called "The father of modern surgery" tells us how his teacher down in Bologna, Bertrucci, used to make dissections and he evidently looks back with pleasure on the profit derived from the years of study he spent in Italy. Many a man before and after him had his experience and his feelings. The magnificent development of surgery that we now know to have come at this time is the proof of how much anatomical studies meant for the evolution of scientific medicine in Italy in the later Middle Ages.

With the beginning of the Renaissance after the fall of Constantinople, the study of the old Greek classics of medicine led to a reawakening of interest in all the biological sciences, but particularly in anatomy and a very important group of men in Italy each one of whom bears a name famous in the history of science did excellent work in that department. Berengar of Carpi declared that anatomy could not be learned by word of mouth, but that sight and touch were absolutely necessary. He himself had dissected hundreds of cadavers though most of his career is in the fifteenth century.

Every distinguished artist of the Renaissance period almost without exception did dissections for himself in order to make his painting and sculpture more real and expressive of the actual structures of the human body. There is a prevalent historical tradition, accepted by most people and even by many who are supposed to be scholars, which has found its way into secular history, though never into

serious medical history, that out of respect for the human body dissection was forbidden at this time by the Church and that what little study of the human body by direct methods was done had to be accomplished in secrecy and with such haste and surreptitiousness as seriously hampered the development of the science of anatomy. Exactly the contrary is the case and there has never been a time in the history of anatomy, even our own, when it was so easy to obtain material for dissection purposes as in the fifteenth and sixteenth centuries. This the many hundreds of dissections made and sketched by Leonardo da Vinci and Michelangelo amply attest.

The tradition of church prohibition of dissection and consequent suppression of scientific anatomical development, is entirely due to the acceptance of a version of history initiated in religious controversy, fostered because it served to discredit the old Church, but it is absolutely without foundation in the realities of history. The men who gave credit and publicity to it meant well enough, but they were ignorant of the real history. Neuberger in his *Handbook of the History of Medicine** says "The Italian professors, incited by the brilliant example of Mondino, surpassed all the other anatomists of the world because they did not disdain to take in their own hands the anatomical scalpel, and it is for that reason that at this time anatomy in Italy was cultivated with greater breadth of vision than elsewhere. The Italian anatomists initiated at the end of the fifteenth century the most famous period in the history of the art of dissection and became the teachers to the physicians of the world."

Attention in recent years has been so much centered on the great anatomists of the sixteenth century, the group of men whose names are connected in some way with Vesalius that it is sometimes apparently thought that Vesalius came down to Italy and woke up the Italians to the value of anatomical science for medicine. Quite the contrary, his academic

* Neuberger and Pagel, *Handbuch der Geschichte der Medicin*, Jena 1903, Vol II. page 23.

excursion to Italy was made, fully aware that he could obtain in the peninsula better teaching, and above all more ample facilities for the study of anatomy and under the guidance of broader minded biological scientists than anywhere in the world, and his long stay of some twenty years shows how well satisfied he was in his new environment.

One of the great world anatomists who did his work mainly before the sixteenth century is Alexander Achillini, professor first of philosophy and then of medicine at Bologna for nearly twenty years, whence he was invited to the University of Padua but after a few years returned to the University of his native city. He has written three anatomical works entitled "Anatomy of The Human Body," "Notes on Mondino's Anatomia" and "Anatomical Studies." His anatomical descriptions are always followed by notes on the maladies to which the different organs are subject and he indicates with marvelous conciseness the principal surgical operations that were done on them. He made a large number of discoveries in anatomy. He described the hammer and anvil bones in the ear, though Morgagni says they had been known to Italians before that time. Achillini described the salivary duct beneath the tongue to which the name of Wharton has since been given. He knew the brain very well, described the first pair of nerves as penetrating the nose and as representing the organ of smell, described the spinal chord as ending in a series of branches in the lumbar region and made a special study of the veins of the arm. Achillini died in 1512, two years before the birth of Vesalius, so that the thoroughly objective study of anatomy, even as early as the end of the fifteenth century in Italy can be understood from his career.

Probably the greatest anatomist of the beginning of the Renaissance, however, was Alexander Benedetti. De Renzi quotes the declaration of a historian of medicine that "Benedetti was the light of Italian medicine in the fifteenth century, the first to construct an amphitheatre for anatomical instruction, one of the first to teach the contagiousness

of the pest and one of the early successful students of syphilis, rhinoplasty, pathological anatomy, and lithotripsy." He received his degree in Padua, traveled for a time in Greece, practiced in the Island of Candia, became professor in Padua and later also professor in Bologna. He was the surgeon for the Venetian army and it was through Venetian influence that he secured his opportunities for study abroad. He labored to replace the reigning empiricism, many notions of which had come from the Arabs, by Hippocratic philosophy. Haller speaks of him as the first original writer on medical subjects who though knowing the classical medical writings depended more on what he had himself observed. Benedetti emancipated anatomical teaching from the too slavish following of Mondino, secured the provision of a number of cadavers for dissection purposes, instituted the first anatomical theatre in 1493 and wrote his treatise on anatomy in five books in 138 chapters before the end of the fifteenth century.

The foundation of this first anatomical theatre is almost exactly 100 years before that founded in Padua for Fabricius da Aquapendente, which is sometimes spoken of as the first, but one had been built at Pisa in 1521 and at Pavia a year later. Nothing meant more for the teaching of anatomy than this removal of the scene of study from the out of the way places where it had been done to handsome public buildings. Only the most profound interest in the subject drew students to the anatomical demonstrations before and there was no temptation to do any special research work. With this development however, everything was changed and no wonder that the next generation during the first half of the sixteenth century accomplished the magnificent work in anatomy that has made its great investigators famous ever since.

Laboratory work in medicine is sometimes spoken of as modern in origin, but the dissecting room was always a laboratory, and whenever the studies in it were pursued in the broad scientific spirit of the Italians, it provided not only knowledge but a training in methods of observation. Our

laboratories of the modern time have sometimes labored under the suspicion of distracting students from strict medical studies, but the dissecting room never had that disadvantage and we owe its introduction and the development of its use entirely to the Italians.

It is with regard to the anatomists of the Renaissance time that Puschmann in his *History of Medical Education* says, "The Italian anatomists had the habit of making the dissections of bodies for themselves and it is for this reason that all the great anatomical discoveries of the time come from Italy. The anatomical schools of that country were the best in the world. All the greatest anatomists of the sixteenth century received their education there and among the masters of the Italian schools are to be found the greatest names of which the science of anatomy can boast."

The man who well deserves the name of Father of Modern Anatomy was Vesalius. He was not an Italian but a Fleming, his family name being Wesel, after the town of the same name in Brabant, but at the age of twenty-one he went to Italy in order to secure opportunities for scientific work in anatomy. He had been unable to obtain anatomical facilities to the extent that he desired them either in Louvain his own university or in the University of Paris, where he had sought them. He stayed in Italy for more than twenty years and revolutionized the science of anatomy. How little of anything even approaching narrow national jealousy, or what we now call Chauvinism, there was in the Italians, will be readily appreciated from the fact that at the age of twenty-seven Vesalius was made Professor of anatomy at the University of Padua and subsequently held similar posts in the universities of Bologna and Pisa and was generally looked up to as a great leader of scientific thought in biology in Italy.

To know all that he did for anatomy one must have studied his great text book which is still a valued treasure not only because it is a real work of art in printing and illustration, but because in all that concerns bones, muscles and

organs the book is actually of great scientific value. The illustrations were made partly by Titian perhaps, but mainly by Calcar, a pupil of the great Venetian master and are among the finest anatomical illustrations ever executed. Only those of Leonardo da Vinci which have recently been republished from the collection of the sketches at Windsor rival them.

Vesalius deserves a place not only in the history of anatomy but also of physiology and of pathological anatomy and of clinical medicine. He was in a word one of the world's great geniuses who found happily for him a fine opportunity for work and expression in the Italy of the early sixteenth century. Beside him there developed a group of men all Italians as his own teachers had been, whose names are irrevocably attached to some of the most important discoveries in the history of anatomy. There was Eustachius after whom the Eustachian canal and other structures are named, Varolius after whom the great connecting structure in the brain is called, Columbus who discovered the circulation of the blood in the lungs; Caesalpinus who described the circulation of the blood in the body a generation before Harvey, Fallopius, after whom a series of structures which he first described is named, Aranzi who taught and demonstrated so well in anatomy at Bologna and to whom we owe the terms hippocampus and the description of the fourth ventricle, as well as the discovery of the origin of the muscles of the eye from the optic cavity. There was very little of gross or macroscopic anatomy left to be described after these great masters had finished their work. Our own Oliver Wendell Holmes in describing the course of the history of anatomy once paid the Renaissance anatomists of Italy this tribute—and it must not be forgotten that for twenty-five years Dr. Holmes was the professor of anatomy at Harvard—first, he said, there came the harvesters of the sixteenth century who gathered all the important discoveries into their granaries from the ripe fields of anatomical science; after them came the gleaners of the seventeenth and eighteenth

centuries who gathered an occasional grain that had not been overlooked but that had been neglected, because considered of so little importance in comparison with the ripe harvest of great discoveries, and finally in the nineteenth century came the geese who discovered a grain or two here and there through the fields of anatomical science and whenever they did they cackled very much over it.

Nor did successful achievement in the anatomical and related sciences stop with the Renaissance or its usually accepted terminal date, 1550. There were great successful Italian workers in biology in the seventeenth and eighteenth centuries. Fabricius da Aquapendente who was born of a family in very moderate circumstances and made his way for himself, is a typical example of these. He made his classical studies in Padua, where in spite of his humble origin the patrician family of Loredano, one of whose members has been immortalized by Bellini's portrait, received him into their house. He had the good fortune to be a special scholar and a favorite pupil of the distinguished anatomist Fallopius. At Fallopius' premature death he was given the task of continuing the anatomical demonstrations at the University of Padua, though he was only twenty-five at the time and at twenty-eight he was made professor of surgery and of anatomy. After a time he became so popular as a teacher that at his own expense he built an anatomical theatre in order to accommodate the numerous students from every part of Europe who came to him. Harvey from England was among their number and every country was represented. The Venetian Senate erected a larger and handsomer theatre for his increasing classes and loaded him with honors. Distinguished people from all over the world came to claim his services as a surgeon and he acquired an immense fortune by his practice. His patients were so well satisfied with what he did for them however, that they insisted on rewarding him with many presents in addition to his fees and he collected these into a cabinet above which was the inscription *Lucri Neglecti Lucrum*,—the profit of neglected gain. He owned a mag-



BELLINI DOGE LOREDANO

nificant country place *La Montagnola* where he was famed for his hospitality. Probably no one of his profession was in higher honor when in 1619 at the age of eighty-two he died.

To him medicine owes the complete description of the valves of the veins which he did not discover, having been anticipated by two Italians, but every detail of which he worked out and pictured in his monograph. After this the complete demonstration of the circulation was only a question of time and Harvey owed much to him. Fabricius also is famous for his work in embryology and especially as a founder of scientific comparative methods for anatomy and embryology founded upon careful observation and thorough comparison of the various structures and appearances. In this also Harvey is under deep obligations to him. While he is famous as an anatomist he devoted himself to surgery with ardor and there are a series of inventions of apparatus for the treatment of torticollis, of spinal curvature and of club foot. He was the inventor of a tube to be introduced through the nose for the purpose of forced feeding and of many surgical instruments.

A man whose career illustrates the opportunities for education in the Italy of his time is Casserio, sometimes known as Julius Casserius the famous anatomist who succeeded Fabricius da Aquapendente in the Professorship of anatomy at Padua. Casserio came of a family in very humble circumstances and was at first the laboratory assistant for the rough work of the dissecting room of Aquapendente. His acuteness of observation, his intelligence and his industry and helpfulness attracted the attention of the professor and he was given an opportunity to lift himself up to an academic career. His books on the organs of voice and hearing and the *Pentaestheseion* or volume on the anatomy and physiology of the five senses are very well known. The latter went through many editions and is still looked upon as a bibliographical treasure. Gurlt calls his chapter on the comparative anatomy of the organ of voice "a brilliant treatise."

WHAT CIVILIZATION OWES TO ITALY

The most convincing testimony to the place of Italians in anatomy is to be found in the number of Italian names that have become attached to anatomical structures in the human body, from the fact that they were named after their discoverers. We may deprecate such nomenclature as unscientific, but at least it serves to set up landmarks in the history of the medical sciences. There is the pons Varolii in the brain, the fissure of Rolando, the Vidian canal in the skull (named after Guido Guidi, Vidius in Latin) the duct of Botallo, a fetal structure in the neighborhood of the heart, the Eustachian tube, the Fallopian tube and the aqueduct of Fallopius, the organ of Corti in the ear and the rods of Corti in the retina, the Malpighian bodies in the spleen, the Malpighian corpuscles in the kidney, and the rete Malpighi in the skin, Scarpa's triangle and the fascia and foramina called after him, and while Steno's duct is named after a Dane, he made most of his studies down in Italy and acknowledged how much he owed to Italian opportunities for all that he did in anatomy. But this is only the beginning of the story as yet. There are in the larynx the cartilages of Santorini as well as the emissary veins of the skull and the *musculus risorius* — the laughing muscle of the face named after him, and we have the ducts of Rivini, Ruffini's nerve endings in the skin, the spaces of Fontana, the sinus of Morgagni, the sinus of Valsalva as well as the functional connection between the throat and the ear, demonstrated by Valsalva's experiment and named after him, the process of Ingrassias, the band of Giacomini and the band of Gennari, the corpuscles of Pacini, the crescents of Gianuzzi, the Pacchionian bodies; there is the nerve of Lancisi, Golgi's processes of brain nerves and the organs of Golgi, the Casserian perforating nerve named after the great Italian surgeon, the foramen of Thebesio, the aqueductus Cotugni, through which the naso palatine nerve described by Cotugno runs. Galvanism, named after Galvani, was discovered in the midst of medical experiments and Voltaic electricity deserves a mention here because it was discovered

in connection with experiments and studies stimulated by Galvani's work.

Not a few of the anatomical discoveries that have come to be known by the names of men of other nations were due originally to Italians. The sutural bones in the skull for instance are known as Wormian bones after Olaus Worm, but they had already been seen by Eustachius and described and even pictured by him. Another example of this same thing is the so-called duct of Wharton leading from the sublingual glands which Achillini described fully as follows: "Two fountains of saliva into which a probe can be introduced are manifest, opening under the tongue and there are glandular masses situated at the end of them." Various names have at times become attached to portions of the peritoneum and its related structures but it is interesting to note in the history of anatomy how the Italian anatomists gradually solved the puzzle of the peritoneum and organs contained in the folds of it. Piccolomini recognized the special character of pancreatic tissue and Eustachius described the capsule of Glisson, though this came to be named after the English anatomist who described it much later. Eustachius also described the renal tubules though these had been seen by Fallopius before him, yet subsequently the name of Bellini, the third investigator of their function became attached to them.

Often when a discovery is made in anatomy by a man of another nationality it is under Italian influence and sometimes in Italy that it is made. Steno, the Dane, studying in Italy, demonstrated that the heart is a muscle. The pancreatic duct of Wirsung, as it is sometimes called, was made in Vesalius' dissecting room in 1542 by his prosecutor George Wirsung. Scultetus, after whom the reverse mode of bandaging is named was not an Italian, but a German, as the un-Latinized form of his name Schultheis indicates, but he and Spigelius, whose name Spieghel also betrays his Teutonic origin, were together at Padua for their medical studies, for there is a record of Scultetus consulting Spigelius

about a surgical case there. After Spigelius is named the Spigelian lobe of the liver.

While it is not generally appreciated the Italian physiologists of the Renaissance were not behind the anatomists in accomplishment. One needs only read De Renzi's chapter on physiology in the second volume of his History of Medicine in Italy to be quite sure of that. Aquilano, Tommasio, Zenone and Giacomo da Forli, Filelfo, Bartolomeo de la Rocca and others wrote on embryology and on various functions. Marliani wrote a book on the Heat of the Human Body in Winter and Summer and of its Heat Regulation. Many others might be mentioned; Lignamine, famous printer as well as physician, wrote on foods; Frigimelica who studied baths and their influence and the possibility of making artificial baths so as to obviate the necessity for distant travel; Cananus who pictured not only the anatomy, but illustrated the functions of muscles; Petronius, who wrote on diet and health; Mercurialis, who studied particularly the effect of exercise and gymnastics of all kinds on the human body and so on through a long list well known to those who are familiar with the history of medicine, are all Italians.

The most significant development of physiology in modern times is that of the discovery of the circulation of the blood. While this is usually attributed to Harvey, there has been endless dispute as to the real discoverer and without wishing to abate Harvey's merit in the matter it becomes very clear that he was anticipated by Italians and that while his thoroughly scientific grasp of the great discovery made it a definite advance in science, he had great Italian predecessors some of them his teachers who had reached conclusions as wide as his own in this matter. There is no doubt at all that the circulation of the blood in the lungs was demonstrated by Realdus Columbus. In his *De Re Anatomica*, published posthumously by his children in 1559, Columbus correctly describes the pulmonary circulation. English writers on physiology have sometimes made little of Columbus' merits and have suggested that this discovery

was more or less of an accident, but Harvey himself spoke of Columbus with high respect as of a great authority. He gives him due credit for all that he had accomplished and for the significance that his work had for his successors like Harvey himself.

Columbus had been the Papal Physician at Rome and a Professor at the Papal University and one of his successors Caesalpinus, was destined to complete the discovery of the circulation of the blood in the body as well as the lungs and to describe its functioning completely. Prof. Foster of the University of Cambridge in his lectures on the History of Physiology during the Sixteenth, Seventeenth and Eighteenth Centuries, delivered before a series of universities in this country admits almost grudgingly it would seem, "We must therefore admit that Caesalpinus had not only clearly grasped the pulmonary circulation, but had also laid hold of the systemic circulation. He recognized that the flow of blood from the tissues took place by the arteries and by the arteries alone, and that the return of the blood from the tissues took place by the veins and not by the arteries." Prof. Foster quotes from Caesalpinus two works, the *Quaestiones Peripateticae* and *Quaestiones Medicae* certain passages which demonstrate beyond all doubt how completely Caesalpinus grasped all the facts of the circulation.

Other Italians made discoveries while Caesalpinus was doing his work which are more anatomical than physiological, but as they discussed function as well as form and as these are confirmatory of the circulation they deserve to be noted. Cannanus, Professor at Ferrara, observed the valves in the veins in 1547 and told Vesalius of his observation. Their real significance was not recognized, however, until Fabricius, himself the student of Fallopius and the teacher of Harvey published his little book *De Venarum Ostioliis*, "The Little Doors of the Veins," which was published in 1574. Fabricius recognized exactly the significance of these and after this only two things were needed to complete the cycle of information necessary to demonstrate the

circulation with absolute certainty. These were the discovery that the heart is a muscle made by Steno, the Dane, while working down in Italy and the other that of the capillaries connecting the arteries and veins made by Malpighi. Harvey *having studied in Italy*, put together all that he had learned there, added his own demonstrations and placed the circulation on a firm scientific foundation.

There are at least two other Italians, Paolo Sarpi and Ruini, for whom claims have been made for the discovery of the circulation of the blood. Henry Stubbs or Stubbe, 1632-1676, an English physician who wrote a work *Legends no Histories or a specimen of some animadversions upon the History of The Royal Society*, London 1670, insisted that Harvey had obtained the original idea for his discovery from Caesalpinus. That was the beginning of the controversy which has lasted ever since, and which the discussion even so late as the meeting of the International Congress of Medicine in London in 1913 shows is not settled yet. There is no doubt at all of Harvey's merits in the matter. He did not originate the idea of the circulation, but he did work it out in such a way that after a preliminary period of opposition the medical world took it up. He did exactly what Darwin did with regard to evolution in the nineteenth century. Darwin's ideas were not new, but the reasons advanced for them were new and of a character everyone could understand, and so evolution became a popular theory. Malpighi's discovery of the capillaries had to be made before the demonstration of the circulation was complete, some objective evidence for Darwinism must be obtained before its place in science is assured.

In the further development of physiology Italian names predominate to a much greater degree than is often thought. This is illustrated very well by the fact that the anatomists whom we have already mentioned did not limit their work strictly to the study of tissues, but worked also in their functions and Fallopius, Eustachius and Columbus, are great names in physiology as well as in anatomy. Malpighi constantly discussed function as well as morphology and one of

the greatest contributors to physiology is Borelli, whose work on the locomotion of animals and on the mechanics of living beings influenced subsequent generations so deeply. In later times Badia and Menghini demonstrated that the blood contains iron and that internal respiration is carried on through the iron salts. The action of air upon blood was demonstrated by Mistichelli. He inflated the lungs of dying animals with air and in this way was able not only to cause the blood to change color, but at the same time to revive the movements of the heart. (Puschmann, History of Medical Education.)

Borelli's great work in physiology is acknowledged by all. Prof. Foster* says that "when we consider the effect which a perusal of Borelli's book has upon the reader, even we can easily understand how he was a founder of a great school which flourished long after him." Steno, the Dane, working in Italy had laid the foundation of the dynamics of muscle and of the explanation of the mechanical problems of the body. His work had followed close on Vesalius' profound speculations in the matter — another foreigner finding his best opportunities for study in Italy. Borelli completed the theories of these two geniuses and wrote a book *De motu animalium*, which is still a classic in its suggestiveness and marvelous intuition into natural processes.

While physiology and anatomy were thus sedulously cultivated the field of psychology was not neglected in Italy, but has been constantly worked by men whose work has often had enduring influence. The old Italian scholastic philosophers, notably Anselm and Aquinas, developed scholastic psychology to a point where it served to explain as well the difficulties of mental operations as probably any system of thought has ever done. This was not all mere speculation for besides reflection there was serious study of dreams, of the phenomena of memory and of many of the peculiarities of mind. This phase of psychology comes more appropriately in the chapter Philosophy. With the Renaissance deep interest was awakened in the curious, unusual manifestations of

* loc cit.

mind, and the writings of men like Jerome Cardan attracted attention to the ulterior significance of dreams, premonitions, and telepathic communications of one kind or another. Cardan's autobiography, quite the equal in interest from a scientific standpoint of Cellini's autobiography, is itself a great contribution to psychology. It is only during the later nineteenth century that Cardan's genius has come into the recognition that it deserves for great originality, initiative of mind along lines which many usually neglect or for some reason consider beneath their notice, though they represent most suggestive materials for the understanding of phenomena that have always excited the attention of mankind.

In more recent years the Italians have been interesting and valuable contributors to the science of physiological psychology. The Marquis of Corti's investigations of the delicate organ of Corti, so-called, threw significant light on the whole question of the perception of sensation. Golgi's work on brain cells was most suggestive as regards certain phenomena of memory and of the reception and storage of sensation. Murri's work with regard to fatigue and similar states has helped to a much better understanding of the relations of mind and body. Great attention was paid to the psychology of the criminal in Italy, and the foundations laid for some serious studies in the science of criminology. These have not proved as significant as they first seemed to promise, but they aroused the attention of the world of our time, and we owe the correction of many false notions to the opening of new lines of thought in the treatment of the criminal to the work of the Italians. Lombroso in his school set the initiative which awakened many minds all over the world.

The influence of Italy in the biological sciences even when priority in original work or in the foundations of a science stand in the name of a foreigner, is well illustrated by the work of Sigismund Elsholz in anthropology. He published a book on human measurements, *Anthropometria*, in 1654, the year after he had received his degree of doctor in medicine at the University of Padua. This book is a fundamental

contribution to anthropology in a very concrete way by observation and measurement and it attracted wide attention. It proved very suggestive to other workers because of its simple directness, and the author's exclusion of theoretic considerations and his limitation of his work almost entirely to thoroughly scientific data and their discussion.

In botany while so much is due to the Northern and Western nations of Europe, the Germans and the English, Brunfels; Fuchs, Tragus, the Corduses, Conrad Gessner, Nehemiah Grew the Englishman, and Linnaeus the Dane, for great pioneer work, Italians shared in nearly every step of this progressive foundation of the science in rather striking ways. Leonardo da Vinci became interested in plants as in every other phase of nature around him, making sketches of the flowers, dissecting them as he did animals, pointing out their various parts, studying the growth of trees and the lines that indicated it, and how much might be judged of the seasons in which lines of varying thicknesses occurred and other details of observation that are supposed to be much more modern. This was of course scarcely to be called science for it represented only a genius' intuition of the meaning of observations that less penetrating minds were to reach the significance of in orderly classified fashion much later.

That the spirit of science and botany was in the air in Leonardo's time is very well illustrated by the fact that the scientific development of botany was taken up in Italy not long after Leonardo's death, and that at the time when the German botanists were doing their basic work, Italians were also occupied with the subject and two great names deserve to be mentioned. Edward Lee Greene has told the story of them in his *Landmarks of Botanical History* (Smithsonian Miscellaneous Collections, Vol. IV 1909) in a single paragraph.

"Contemporarily with these German herbalists there flourished in Italy a learned professor, first at the University of Padua, then at Bologna, afterwards at Pisa, whom people

regarded as the one peerless botanist of the time. His university lectures were received as oracular and students came to him from almost everywhere in Europe, yet Professor Luca Ghini published nothing. His supremacy as the botanist of the first half of the sixteenth century is attested by tradition only. In the very next generation after him, several of the chief luminaries of the science were men whom he had trained, and to one of them, Caesalpino, there is nowhere accorded the praise of having created the epoch of modern botany. To what extent is Caesalpino's great work, *De Plantis*, a product of the mind of Ghini? The question is one that forces itself upon us and is perhaps the more interesting because hopeless of ever being answered."

Caesalpino or Caesalpinus, whose name we have had to mention so often in this chapter on biological sciences, is really one of the great founders in botany. Linnaeus said of him in the next century that the Italian biologist was the first in the order of time among real systematists, *primus vere systematicus*, in botany. His work *De Plantis* is one of the classics in the history of botanical science, published at Florence in 1583 at a time when the eyes of the world were centered on Italy, and when most of the scientific initiative came from her this book attracted wide attention. Its distribution of the 1520 plants then known into fifteen classes—the distinguishing characters being taken from the fruit, showed the possibility of bringing order, out of what up to this time must almost have seemed the impossible chaos of plant life. It is easy to understand then why Linné, who took upon himself the task of correcting and developing this systematization, should have so thoroughly appreciated his great Italian predecessor whose work very probably he found not so much of use as of encouragement.

How near Caesalpinus came to anticipating the discovery of sex in plants, if indeed he must not actually be rightly considered to have discovered their sex differentiation, can be readily appreciated from his expression that "a 'halitua' or emanation from the male plant fertilizes the female."

This expression occurs in his *De Plantis* which was published in Florence in 1583 almost exactly a hundred years before Nehemiah Grew's *Anatomy of Plants* (London 1682) to which the first scientific account of sex in plants is usually traced.

One of the distinguished Italian physicians of the seventeenth century was equally distinguished as a botanist, chemist and surgeon. He laid out the Botanical Gardens at Messina, where he cultivated many foreign medicinal plants, and one of his pamphlets written in 1653 calls attention to the cinchona plant and its curative properties in cases of malaria. At this time Castelli was one of the best known of the medical scientists of the time, and even the distinguished Danish anatomist, Thomas Bartolinus felt that it was well worth the trouble and time involved in the long journey from Denmark to Italy to visit Castelli at Messina in order to get more closely in touch with his scientific methods. The incident only serves to show how widespread was the influence of Italian science at this time, and from how far men were attracted to the Italian peninsula in order to have the advantage of touch with it.

The greatest contributor to botany in Italy, however, was a man noted for his contributions to many departments of biological science. Malpighi, wandering in the gardens of the University of Messina one day, saw the uneven fracture of a growing limb and recognized in the dependent portions that bundles of little vessels had been broken off irregularly. He had always been interested in the vascular system of animals and now he took up the study of the vascular system of plants. The result was his monograph on the anatomy of plants which was published by the Royal Society of England. Just at this same time Nehemiah Grew, working in England, was writing his anatomy of vegetables. The incentive for scientific development was in the air. Indeed, the day on which Malpighi's first sketch of his discoveries in botany was presented and read before the Royal Society happened to be the very day on which Grew presented to the Society his printed book *The Anatomy of Vegetables*.

Prof. Michael Foster in his *Lectures on the History of Physiology* (Cambridge University Press 1901) lectures which were delivered at a number of the great universities says, page 93: "But everyone who has read the two works by the two men must acknowledge that while that of the Englishman is a sound piece of honest arduous labor, that of the Italian, no less sound, though perhaps less abounding in valuable detail, shines more than does the other, with the light of genius, and is richer than the other in philosophic insight." To Malpighi, anatomist, physiologist, botanist; as well as physician, must deservedly be given the name of founder of the science of comparative biology and especially of comparative anatomy.

One of the great names in the biological sciences of the seventeenth century with world fame ever since, is that of Francesco Redi, who is probably better remembered in his own country as a poet than as a biologist, though he did some really epoch making work in the biological sciences, and this has come to mean more during the present generation than perhaps ever before. He was physician to the Grand Dukes of Tuscany, taught literature in the University of Florence, was an active member of the *Accademia della Crusca*, aiding in the preparation of the Italian dictionary, and was one of the first members of the brilliant academy known as *The Arcadia*.

His scientific work turned almost entirely on the problems of Spontaneous Generation. He made a series of observations on vipers and of experimental investigations on the generation of insects. It was this latter subject that led him to the generalization that there is no spontaneous generation, and that the appearance of minute crawling creatures in decaying material is due entirely to the laying of the ova of insects in such materials, and not to corruption producing maggots. Spontaneous generation so far as minute living things are concerned had been accepted by practically all scientists before this time, and it continued to be at least the popular belief for a long time afterwards. Even at the pres-

ent time there are many who are inclined to think at least of the possibility of spontaneous generation. Redi's work was thoroughly scientific and was frequently referred to in the later nineteenth century because it represented definite conclusions from observation and experiment and not the theorizing which has always been so common in the history of science, and is not nearly so absent from our scientific discussions of the present day as many seem ready to declare.

There are three great names in the biological science of the eighteenth century. They are those of Vallisnieri, the Professor of Botany at Padua, whose chair had been the centre of interest in the natural sciences for many years at the time of his death; of Spallanzani, professor in the biological sciences successively at Reggio, Modena and Pavia, though he was also offered the chairs of Coimbra, Portugal and Parma and Messina in Italy; and finally that of Morgagni, whom Virchow greeted as the Father of Modern Pathology. All three of these men were recognized by the world of science of their time as the most distinguished teachers and investigators in their special subject. They were made honorary members of many of the important Italian and foreign academies and scientific societies of the time, and were the personal friends of many of the men who were working in science in every country in Europe during their lives. Anyone interested in science who went down to Italy at this time made it a point, if possible, to meet these men. They were the leaders of scientific thought, recognized as such, and their works were read widely and referred to confidently everywhere in the scientific world of the time.

Spallanzani, like Redi, in the preceding century, has come into prominence again in our time because his experimental work in biology was occupied with so many of the problems that are now the theme of earnest discussion and experimentation. He took up particularly the subject of regeneration and showed by many patient ingenious experiments that a great many of the lower animals like the lizard and the snail, if accidentally injured, regenerate even the most

WHAT CIVILIZATION OWES TO ITALY

important parts of their body. The land snail actually regenerates what seems to be its head. It was afterwards shown that this does not contain the brain, though it contains the eyes, mouth, tongue and teeth and these are all regenerated. There was little left to learn about the principles of regeneration after Spallanzani had finished his investigations, though ampler details of information have been supplied by modern studies. The full significance of Spallanzani's work has only come to be properly appreciated now that this subject of regeneration in biology has proved to be a crux for the theory of natural selection, which utterly fails to account for it, and therefore can not be considered as a basic theory of the origins of living things.

Italians continued to be noted as the biological experts as regards smaller living things well into the nineteenth century, so that when the material of the famous Challenger expedition was to be worked up to the best possible advantage for science, that portion of it expected to furnish new information with regard to the diatoms was handed over for investigation to an Italian, Francesco Castracane degli Antelminelli, the recognized world authority on the subject. In the course of the investigations he discovered three new genera, 225 new species and some 30 varieties.

As an illustration of how much work of more than passing significance Italian investigators are doing in the biological sciences related to medicine at the present time, and indeed how important are their contributions in this department the subjects of the physiology and general biology of the parathyroid glands may serve our purpose. While these glands were discovered and described by a Swede, Sandstroem, thirty-five years ago and their physiology elaborated by Gley at Paris in 1891, a large number of the names that are associated with the development of our knowledge of the thyroid are Italians. In his original paper in 1891 Gley mentioned Colzi, Tizzoni, Ughetti and Mattei as having worked on the subject before him. Morel in his monograph on the Parathyroids in Professor Dastre's collection of mono-

graphs on *Biological Actualities** mentions a number of other Italian names that show how much Italian investigators were occupied with this important subject. Among others there are Cavalleri, Livini, Capobianco and Mazziotti, Sanquirico and Orecchia, Cristiani, Coronedi, Luzzato, Albertoni, Masaglia, Sciolla and Corsi, Canalis and Colzi, Fano and Zanda, Sgobbo and Lamari and others literally almost too numerous to mention.

Some of the most important features of our knowledge of parathyroids and some of the most ingenious suggestions that have enabled us to eliminate the false from the true with regard to them has come from Italian workers in this department. Their publications have shown a fine appreciation of the work of others, a thorough knowledge of the literature and a patient investigation, yet with a power of imagination to lead them that shows the genius of their nation. A study of the bibliography of this subject shows that the Italians have done much more than their share of the work of the world of science in this important newly developing subject. This is not said to make little of the work of other nations, for there is probably no recent development in science that makes so clear the solidarity of the world of science and utter disregard of national boundaries than this rapid accumulation of facts during the past two decades with regard to these minute ductless glands, which have proved, however, to be so important in pathology and physiology. There are very few who realize, outside of Italy itself, how many serious biological investigators are to be found at Italian Universities and how much their work counts in the world's congress of science.

In the chapter on medicine we have called attention to the foundation of botanical gardens in Italy first in association with the monasteries and then in connection with the universities. It was after the establishment of the University Botanic Gardens in Italy and the observation by students who went down to the peninsula of the amount of good accomplished

* Paris, 1912.

WHAT CIVILIZATION OWES TO ITALY

by them that university botanic gardens were founded in other countries. Most of these in foreign countries date from well on in the seventeenth century, while those founded in Italy came in the first half of the sixteenth. These botanic gardens established originally for medical purposes soon attracted attention to the study of plants as such, and gave a great impetus to the development of the science of botany. Among the prefects of the botanical garden at the University of Padua were the eminent botanists Anguilara and Prospero Alpini.

MEDICINE

AS THE once very prevalent, indeed quite general, impression that almost nothing in medicine worth while talking about was discovered until during the last few generations, gives way to the truer idea which increasing interest in the history of medicine in recent years has brought out so clearly, that men at many times in the past have accomplished work of lasting significance in the medical sciences, Italy's extremely significant place in medicine comes to be recognized more and more. It has been the custom to think that in the older times and above all in the Middle Ages physicians failed to make any progress in medicine largely because they trusted too much to the authority of the ancients and dared not think for themselves. The Italians are commonly presumed to have been particularly liable to this fault and to this almost more than anything else was thought to be due the absence of anything like important progress in medical science in Italy for many centuries especially in the medieval period. The incubus of too great trust in authority to the exclusion of personal research and observation is supposed to have remained until almost our own time.

Unfortunately for any such presumption we have found that once the genuine history of medicine is known, significant progress in the medical sciences, some of which through almost inexplicable lapses was lost afterward, is very easy to trace in the older times, not a little of it in the medieval period. After all it would be quite inexplicable if centuries and peoples who did great work in art and architecture, in literature and philosophy should have been lacking only in

the medical sciences. As for Italian devotion to the authority of Hippocrates and Galen hindering progress in medicine, everyone of the distinguished authorities in medicine at all times, even when men have been most progressive in medical science, have recognized how much these great Greek thinkers meant for medical science, above all in their power of direct observation of patients. That is, when all is said, by far the most important part of medicine at all times.

Medieval and particularly Italian respect for such supreme contributors to human thought as Hippocrates, Aristotle and Galen, far from being the stigma of lack of original thinking that it used to be considered, has come now to be recognized on the contrary as an index of the deep intellectual interest and nice critical judgment of generations of the Italians. Aristotle is undoubtedly the greatest philosophic writer who ever lived. Probably no physician in the whole history of medicine has reviewed the problems of human illness more sanely or with clearer vision than Hippocrates. The more we have learned about Galen in the modern times the more we have come to think of him. Sydenham and Boerhaave in the later seventeenth and early eighteenth centuries reformed medicine by bringing it back to Galen and Hippocrates. The great scholars of the Renaissance some of the greatest geniuses of modern times may be said fairly to have worshipped at the feet of Galen. It is easy to think little of him, but to do so one must know little about him. To read Galen's works sympathetically is to recognize at once that here is a master of clinical observation of the nicest scientific acuity and of marvelously sympathetic vision for the ills of mankind.

If the Italians had done nothing else in science and medicine but insist on keeping the world in touch with these great Greeks, that itself would have constituted an important element of the debt which civilization owes them. Of course there were abuses in the devotion to the Greek masters. Many minds bound themselves too rigidly to

authority and swore by the very words of the chosen master, but that is true of small minds at all times in history. Even in such cases when the master they swear by is as great as were these wise Greeks there is some hope for the disciples. When the master, as is unfortunately so often true in the modern time, is some narrow specialist who endeavors to explain all of the enigma of disease and solve the problems of human ills by some superficial formula or by some fine spun theory, then the consequences are really unfortunate. The large minds among the Italians were very far from any such slavish subservience. Over and over again Italian thinkers insisted that even the great Greek masters were "not gods but men" and therefore liable to error and that their doctrines must therefore not be followed with absolute submission, but with that rational critical eclecticism so necessary to keep opinions in touch with the growth of information.

The Romans themselves did not practice medicine but left this task for foreigners, slaves and freedmen, as a result there was no development of medicine in the peninsula, their one merit being that they appreciated the Greeks and passed on their great work in medicine to succeeding generations. It was not until after the gradual decadence of the Roman Empire that medicine came to receive any independent attention in Italy. Cassiodorus, who after having been Imperial Prime Minister under Theodoric, later became a monk, recommended particularly the study of medicine to the monastic brethren both for the preservation of the health of the community and also in order that they might help those who lived on the monastery estates in case of illness. His enumeration of the books that should be studied show a breadth of knowledge of the medical classics that is surprising in his time. After this it is not surprising to learn that there is a well grounded tradition that at Monte Cassino medical teaching was one of the features of the education provided there by the monks. It was under their influence down at Salerno that the first great medical school of modern times was

developed beginning probably late in the tenth and continuing during the next three centuries to attract wide attention and make medical science a living reality in Europe.

The first great physician of modern times is Constantine, known in history as Africanus because he was born in Carthage. He studied in the Orient and returned to practice in his native town, but life there was made very uncomfortable for him, because through his Eastern travels he had obtained so much more knowledge of medical subjects than his colleagues in Carthage possessed that his advantage over them on his return made his professional brethren jealous of him, and they even did not hesitate to accuse him of practising magic. About this time Constantine's work attracted the attention of Duke Robert of Salerno who invited him to become his physician. After a time Constantine became a royal counsellor and private secretary to the Duke, and afterwards a professor of medicine at Salerno. After some ten years of teaching he gave up his professorship to retire to the Abbey of Monte Cassino where for many years he wrote the books which have made him famous. It has been said in modern times that a great institution is usually the lengthened shadow of a man, and Salerno must be considered more that of Constantine than of any other.

How important Salerno became in the history of medicine is very well summed up by Pagel, the well known German historian of medicine. He is emphatic in his praise, but not more so than this first great European medical school deserves. He has called attention particularly to the originality of the work accomplished there and that of itself is the highest compliment to its Italian founders that could be paid. Pagel said: "If we take up now the accomplishments of the School of Salerno in the different departments, there is one thing that is very remarkable. It is the rich, independent productivity with which Salerno advanced the banners of medical science for hundreds of years, almost as the only autochthonous centre of medical influence in the whole West. One might say that it was like a *versprengten Keim* —

a displaced embryonic element — which, as it unfolded, rescued from destruction the ruined remains of Greek and Roman medicine. This productivity of Salerno, which may well be compared in quality and quantity with that of the best periods of our science, and in which no department of medicine was left without some advance, is one of the striking phenomena of the history of medicine. While positive progress was not made there are many noteworthy observations to be chronicled. It must be acknowledged that pupils and scholars set themselves to their tasks to further, as far as their strength allowed, the science and art of healing. In the medical writers of the older period of Salerno, who had not yet been disturbed by Arabian culture or scholasticism, we can not but admire the clear, charmingly smooth, easy-flowing diction, the delicate and honest setting forth of cases, the simplicity of their method of treatment, which was to a great extent dietetic and expectant; and while we admire the carefulness and yet the copiousness of their therapy, we can not but envy them a certain austerity in their pharmaceutic formulae, and internal medicine was especially developed. The contributions to it from a theoretical and literary standpoint, as well as from practical applications, came from ardent devotees.”

With the first development of a modern medical school in Europe at Salerno a change came over the face of medicine and the Arabian polypharmacy was abandoned for much more rational therapeutics. Diet, exercise, fresh air, the abundant use of water internally and externally, and the attempt to help nature in her curative efforts, to assist the *vis medicatrix naturae*, an expression which became a favorite at this time, took the place of the former meddlesome therapeutics. Salerno itself since become the seat of the most virulent kind of malaria was then one of the most salubrious places in Europe, beautifully situated and particularly favorable in its climate for patients who living in the cold north were greatly benefited by a sojourn during the winter far from the fogs and dampness and vicissitudes of the climate

of their Northern homes. No wonder then that a great many members of the nobility and even patients of royal birth came to Salerno and were cured of their ills and returned to encourage others to go there. Salerno became the great health resort of Europe and continued to be so for several centuries.

When the universities of Northern Italy preempted the place that had been held by Salerno the development of medicine continued. Unfortunately with the evolution of science and especially chemistry and botany there came to be an impression that these departments of knowledge contained the solution of the mystery of the cure of disease and as a consequence men were distracted away from the natural modes of cure that had been developed at Salerno. What the northern universities of Italy accomplished however was the development of pathology, after normal anatomy had been studied mainly for the sake of surgery and for medical diagnosis, so that medicine began to develop out of the art that it had been into the science that it was to become.

As a matter of fact it is easy to trace magnificent original Italian contributions to medicine and surgery all down the centuries for at least eight centuries. So important is the development of surgery due to the Italians that it must be treated in a separate chapter. As regards most of the medical sciences, the great foundations of them were laid either by Italians or by men who received their medical training in Italy. Not a few of the great discoveries made by those who were not Italians were actually reached while these men were students in Italy. In the Italian peninsula came the development of anatomy with Vesalius and his great predecessors who have been quite unknown to the general reader until comparatively recent years and his distinguished contemporaries and successors, many of whose names as Eustachius, Fallopius, Varolius, Malpighi, are never to be forgotten landmarks in the history of the science because they came to be attached to the organs which they had

discovered, or first described, or pointed out the significance of. In physiology all the preparatory work for the discovery of the circulation of the blood was done in Italy and Harvey himself had been a student at Padua and frankly confessed his obligations to his Italian masters in the introduction to his published work.

What is thus true of anatomy and physiology is equally true of the sciences of pathology, diagnosis, and therapeutics. In pathology the Italians were for centuries the great pioneers. In diagnosis the more one knows of the details of the clinical observation of the Italian physicians the more one recognizes the fact that for acuity of vision and logic of conclusion in the differentiation of disease they easily bear off the palm from all the other nations. Important developments in diagnosis came from men of other countries, but the great body of the science of diagnosis is Italian in origin. As for therapeutics from the time when Italian physicians and surgeons as early as the eleventh century corrected the polypharmacy of the Arabs and substituted the employment of natural means of cure, through the period when their colleagues of the thirteenth and fourteenth centuries determined the mode of use of mercury for specific disease — a development of therapeutics that is probably the greatest ever made — and the subsequent period when the proper employment of so many drugs from opium to quinine were tested out more successfully in Italy than elsewhere, down to our own time when Italian work in therapeutics in many departments has attracted wide attention, the physicians of the peninsula have nearly always been looked to for thoroughly conservative yet progressive observation.

In the last hundred years, other nations have surpassed them and yet not nearly so much as is usually thought. In none of even the three last generations has there been a time when great Italian medical scientists have not been thoroughly appreciated by their colleagues in other countries. During all the eight centuries before the nineteenth,

there was scarcely ever a time when the Italians were not leaders in medicine and when men of all the various countries of Europe desirous of securing opportunities for the study of advanced medicine that could not be readily studied at home were not in the habit of going down to Italy for post graduate work. At the beginning of the nineteenth century as a consequence of Napoleon's disturbance of Europe, Italy lost her prestige for a time to France; in the latter half of the nineteenth century and in our own time down to the war, Germany usurped French primacy but neither of them to the entire exclusion of Italy. Every faculty for the study of medicine in its scientific aspects was developed finely down in Italy.

The invention of printing had scarcely been made a practical feature of life before medical books began to appear. In the course of half a century all the important medical and surgical treatises of the Middle Ages were printed thus saving them for the modern world, for they existed only in manuscript and they would surely have disappeared during the century of almost absolute neglect of the history of medicine which occurred before the nineteenth century. To Italy we owe far more than to any other for this conservation of medical classics. Some of these medical books were printed in magnificent editions on good paper with excellent type and have become bibliographic treasures. Early in the sixteenth century physicians began printing their own books and securing good illustrations for them. Some of them as for instance Vesalius' *Fabrica*, came to be model text-books and evidently no expense of time or care was spread in making them monuments of the taste and ability of the time. Important books with regard to all the various subjects in medicine were written and published by the Italians. It would be easy to make a very long catalogue of important Italian books on medicine and allied subjects. There are literally hundreds, probably even several thousand of these old Italian medical books that now command good prices and with the growth of medical book

collectors in our time, it becomes increasingly difficult to get hold of them because they are treasured by their owners and but rarely get into the channels of trade.

Only comparatively slight extension of portions of the brief outlines of Italy's place in medicine thus laid down will be necessary to make clear how literally true are all the claims made for her achievements in the medical sciences. The most important scientific development of medicine in modern times came in connection with pathological anatomy. We now realize that this is the all significant underlying science of medicine. Only entire lack of knowledge of the history of medicine would permit one to ignore that the most important contributors to the foundation and the superstructure of pathology are Italians. At the International Medical Congress held at Rome in 1894, Professor Virchow of Berlin, himself the greatest contributor to pathological anatomy in our time, and besides a long time medical editor, well acquainted with the history of medicine, delivered one of the presidential addresses, taking for his subject Morgagni as the Father of Modern Pathological Anatomy. There is no doubt at all that the title thus accorded was eminently deserved and that Morgagni's work is the most important in this department that we have from anyone. His great book on "The Seats and Causes of Disease," published about the middle of the eighteenth century is still a classic in medicine. Far from growing old or antiquated in any sense of the word and becoming in the course of time and the progress of medical science so out of date that only the dry-as-dust scholar intent on details of history knows anything about it, or cares to give time to reading of it, the distinguished English professor Benjamin Ward Richardson said of it:

"To this day no medical scholar can help being delighted and instructed by the study of this wonderful book. To move into it from the midst of a body of current medical literature, is like passing from the periodical flux of current general literature to the perusal of a Shakespearean drama,

the Pilgrim's Progress, or Paradise Lost. It is a transition from the mediocrity of incessant repetition of well-known truths told in loud and hackneyed terms, back to descriptions derived direct from nature and fresh from her treasury. It matters not where the book is opened, it is always good and instructive reading, full of suggestion and rich in original narrative."

Before Morgagni's time there were many distinguished contributors to pathological anatomy in Italy and there have been many since. About the middle of the fifteenth century information as to the definite changes produced by disease began to accumulate and three distinguished teachers of medicine, Montagnana of Padua, Savonarola of Ferrara and Arcolani of Bologna, described a number of different pathological conditions, which they had noted in connection with the diseases of their patients whose bodies they had had the opportunity to dissect after death. Then came Benedetti the Professor of Anatomy at Padua and the founder of the anatomical theatre of that university, who made a series of reports on gall stones and apoplexies. Benivieni, a simple practicing physician at Florence, recorded a large number of pathological observations and has sometimes been called the father of pathological anatomy. Prof. Allbutt, the Regius Professor of Medicine at the University of Cambridge, England, does not hesitate to say of Benivieni: "Before Vesalius, before Eustachius, he opened the bodies of the dead as deliberately and clear sightedly as any pathologist in the spacious times of Baillie, Bright and Addison." Malgaigne the French historian of medicine, has described his book as "the only work on pathology which owes nothing to anyone." These tributes be it noted, are from foreigners, not from his own countrymen.

Every one of the great Italian anatomists of the Renaissance made pathological observations: Berengar of Carpi, the first to observe the appendix, Aranzi the Professor of Medicine and Anatomy at Bologna, who paid special attention to tumors, Eustachius, who tells of many things that he



GIROLAMO FRACASTORO (1484-1553).

had discovered, but whose untimely death robbed him of the chance to publish the details—his anatomical plates show how well the work would have been done had he been spared to do it; Columbus the discoverer of the circulation of the blood in the lungs, who made autopsies even on high ecclesiastics for the purpose of determining the cause of death, and Vesalius, working in Italy, who like Eustachius, promised to publish his pathological observations, but unfortunately was prevented from doing so by his untimely death; Fracastorius, who in his work on contagion, made a clear statement of the problems of contagion and infection, recognized typhus fever as an independent disease and clearly anticipated our knowledge of the contagiousness of phthisis, is but another of this great group, only less well known. How Fracastorius anticipated the most modern ideas as to contagion is particularly interesting. Osler says of it: "Fracastorius draws a remarkable parallel between the processes of contagion and the fermentation of wine. It is not the same as putrefaction, which differs in the absence of any new generation and is accompanied with an abominable smell. Certain poisons resemble contagion in their action, but they differ essentially in not producing in the individual the principle or germ capable of acting on another person."

Fracastorius illuminated every subject that he touched and he touched many in his lifetime. Garrison in his *History of Medicine* (Saunders Philadelphia, 1913) to whom I am indebted for a number of these details, says that "Fracastorius was at once a physician and poet, physicist, geologist, astronomer and pathologist and shares with Leonardo da Vinci the honor of being the first geologist to see fossil remains in their true light (1530.) He was also the first scientist to refer to the magnetic poles of the earth (1543)." He was the inventor of the word syphilis and his treatise *De Contagione* (1546) is famous as the first book in which is stated with absolute clearness the modern theory of infection by microorganisms.

This whole problem of infection was treated by successive

Italian scientists after Fracastorius, in a way that shows the genius and leadership of the Italian scientists. It has sometimes been said that Fracastorius' expressions and his work were never fully understood until modern times. In their paper on "The Development of the Doctrine Contagium Vivum" read before the Seventeenth International Congress of Medicine (London, 1913) Dr. Charles and Mrs. Dorothea Singer, after looking into the question rather thoroughly, suggest that it would be quite impossible for them to "mention even a tithe of those sixteenth century writers on the plague and other infectious diseases who owed their theories entirely to Fracastorius." They then say further:

"Among those who comprehend him more thoroughly, may be mentioned the botanist Andrea Matthioli (1554), who applies the theory specially to rabies, Francesco Boccacino (1556), Gabriel Ayala (1562), Jerome Donzellino (1570), Antonio Saracenus (1572), Philip Ingrassias (1576), and Andrea Gratiolo di Salo (1576). Especial mention may be made of Le Paulmier de Grentemesnil, who, in 1578, re-applied Fracastor's views to syphilis and Jerome Mercurialis, who followed Fracastor very closely and spoke of him as 'the first who opened men's eyes to the nature of contagion.' "

They suggest even that in certain works of the sixteenth century there are some additions to Fracastorius' conception though it is not always easy and is even sometimes impossible to trace such suggestions to their true source. "Thus the great name of Jerome Cardan may be associated with the suggestion that the seeds of disease are truly living and reproduce their kind after the manner of minute living animals. (1557) In the preceding year (1556) Victor de Bonagentibus in his book *Decem Problemata de Peste* (Venice 1556) freely compared the generation and conveyance of fevers to the putrefactive processes which produce 'worms' in corpses. Gabriel Fallopius in his treatise on *lues* (*De Morbo Gallico* Tractatus, 1564) has an expression which shows



BELLINI.

very clearly how well the Italians even as early as the middle of the sixteenth century anticipated many ideas of the spread of contagious disease, which are supposed to be at least two centuries later. Fallopius said, "Every contagious disease spreads itself throughout the whole infected substance." "Thus, in phthisis the force of contagion is conveyed by the vapor which comes from the lungs. This vapor contains certain minute corpuseles of the blood which issue forth with the breath and are spread by the circumambient air. So they are attracted to the lungs of another and if they thus reach suitable soil they infect it and communicate the disease." (Singer).

In the seventeenth century, a series of workers in Italy carried still further this idea of living agents of contagion and the comparison between fermentation processes and disease. In particular, Andreas Baccius or Bacci, who was one of the Papal physicians to Pope Sixtus V, is said by the Singers to have "gained a clarity of view, distinctly ahead of his age in dealing with the nature of fermentation." Baccius had written books on "The Wines of Italy" and on "Poisons and Their Antidotes" and as he was professor of botany, was very ready to recognize the place of biological growth as a factor in the production of widespread consequences. Some of his passages show very clearly that men of the middle of the seventeenth century were thinking many thoughts that are now familiar in current scientific literature and using expressions not very different from those we use at the present time. It is true that they did not quite understand all the meaning of the expressions they used, but on corresponding subjects, it is almost equally true that we realize how much there is left for us to know with regard to many things which we state rather categorically.

Other Italians were deeply occupied with some of these same problems. Harvey, the English physiologist, writing to Naldi in 1653 said, "Among other things that delighted me greatly in your book was that part where I see you ascribe plague almost to the same efficient cause as I do animal

generation." Father Athanasius Kircher is of course not an Italian, but practically all of his great work was done down in Italy and altogether he spent some sixty years in the peninsula. In his volume on the pest, he makes it very clear that he understood just how organisms of very small size must be the active agents of contagion. He used the microscope constantly and was quite sure that he had seen living and moving *corpuscula* in the blood to which he referred the origin of the disease. Just what he meant by the word *corpuscula* can not now be decided and it is possible that he saw nothing more than blood corpuscles, but he certainly had a very definite idea which anticipated our modern theory of infection by microorganisms and the spread of contagion by microscopic agencies.

During the eighteenth century Italy continued to have distinguished medical scientists who anticipated some of our modern teachings. The Singers in their review of the development of the doctrine of *contagium vivum* are enthusiastic in their expressions of admiration for "the splendid work of Lancisi." They mention the names of other Italians, however, and particularly that of Valisnieri and his school, who "seized on the analogy between scabies and febrile diseases and drew the obvious conclusion." Vallisnieri obtained a good view of the corpuscles of the blood and was among the first, if not the very first, to distinguish white from red blood corpuscles. The Singers add: "He has also the merit of clearly realizing that the minute organisms which he believed to be the actual cause of infection were of an altogether different nature to the microscopic infusoria with which he was acquainted."

When taken in connection with this, Lancisi's views as expressed in his book *De Noxiis Paludum Effluviis* (Geneva 1718), are a demonstration of the very modern way in which these older Italian medical scientists faced the problems of disease production and distribution. The Singers sum up Lancisi's views and those of some of his contemporaries in this paragraph.

“Working in a malarious country, he clearly grasped a relationship between gnats and malarial fever. He traced accurately the course of development and life history of these pernicious insects, and he came very near modern views on the nature of malarial and plague infections. Accepting the view that minute creatures are related to infection, he suggests that worms or insects themselves nesting in our blood, but from ‘the organic effluvia’ carried by them, which ‘ferment’ within us. As to the exact nature of the ‘organic effluvia’ or ‘ferments,’ Lancisi suspends judgment until wider and more careful microscopic experiments have been made, although he is well aware that the power of spontaneous multiplication presented by these ‘ferments’ partakes of the nature of life. Lancisi thus represents the high-water mark of philosophical speculation before the actual demonstration of the real organic cause of febrile disease. Meanwhile Vallisnieri attributed disease of man and beast to vermicules and had many Italian adherents. Throughout the eighteenth century, current views of infection are usually inferior to those of Lancisi and Vallisnieri, and although some writers, aided by a lucky guess, reached nearer the modern view, nevertheless they represent the best opinion of the early eighteenth century.”

After pathology diagnosis is the most important branch of medicine and in this Italians have a like preponderant place. Italian contributions to our knowledge of heart diseases illustrate very well how much is owed to the medical scientists of the peninsula and how much earlier they treated many important subjects in medicine than is usually thought. Professor Vierordt in his Chapter on the History of Heart Diseases has reviewed the subject in Puschmann’s Handbook of the History of Medicine (Vol. II). Vierordt is himself a distinguished contributor to the subject in the modern time, thoroughly familiar with German, French and English contributions to this specialty, so that he is not likely to exaggerate Italy’s place. In the seventeenth century Pissini, Bartoletti and Malpighi, made some interesting observations

on the pathological anatomy of the heart. Lancisi, Albertini and Morgagni in the eighteenth century did much to lay the foundations of our modern knowledge of heart diseases. They laid down the principles on which hypertrophy and dilatation of the heart can be best explained and treated, suggested the significance of disturbed valvular function and the associated pulmonary congestion and catarrh. Albertini and Valsalva, in the eighteenth century, outlined a course of forty days of "rest and hunger cure" for aneurism. This is the method which attracted so much attention again in the hands of Bellingham and Tufnel during the nineteenth century.

The connection between heart diseases and certain infectious diseases notably scarlet fever and diphtheria, had been suggested by Benivieni and Rota and Bartoletti and many important observations in this matter were made by subsequent Italian pathologists, notably by Morgagni. The effect of *lues* upon the heart had been emphasized by Lancisi and afterwards by Morgagni. What we now know as heart aneurism, designating thereby a partial dilatation of the wall of the heart was first described by Galeazzi in 1757.

These Italian clinicians of the older time particularly Pissini and Albertini (seventeenth century) as well as Lancisi and Morgagni (eighteenth century) described nervous conditions of the heart and recognized palpitation of the heart due merely to nervous factors as an important clinical condition. Morgagni's contributions to this subject have often been referred to in the modern time and some of Lancisi's observations are well known. At a time when the status of the heart as a serious factor in pathology was making way, they called attention to the fact that heart symptoms were not always necessarily connected with heart lesions, but might be due to extra-cardiac factors that had no serious significance as regards possible fatality.

Some idea of the extent to which attempts were made to classify heart disturbances by the earlier Italians will be obtained from Santorio's classification of seventy-three

kinds of pulse which was even more than Galileo had been able to differentiate though he had begun with Galen's classification of twenty-seven. Italian studies in the pulse continued to attract attention, though Lancisi and Morgagni's work on the nervous heart conditions tended to restore the balance of common sense and keep physicians from giving exaggerated significance to trivial details of minute differences of heart function.

One of the significant contributions to medicine in the Renaissance period made by an Italian was not written by a physician and yet has been widely read and has deeply influenced many generations ever since, having been issued in many editions in practically every modern language. This is Luigi Cornaro's "Treatise on the Simple Life," its title in the original Italian was *Trattato della Vita Sobria* and Cornaro though an Italian was a thorough believer in that word sober as used in English for abstention from intoxicating fluids as well as indulgence in over eating. Garrison in his History of Medicine, suggests that "it is probably the best treatise on hygiene and the simple life in existence." It has been frequently reprinted and after four centuries, is still reprinted often enough, in all languages, to make it clear that it has a universal appeal. The fact that the writer after finding himself broken down in health at forty, worked out for himself a diet and a mode of existence, which not only restored him to health but enabled him to live until he was past ninety-nine, has always given the book a vogue among readers though Cornaro's emphatic insistence on self denial has not always made disciples in fact as well in thought. This was not the first important contribution to popular medicine from Italy however, for the oldest manual of popular medicine in Europe published and republished many hundreds of times and still often reprinted is the *Regimen sanitatis Salernitanum*, the famous Rule of Health of Salerno.

The development of mechanical aids to diagnosis represents an interesting chapter in the story of Italian

contributions to medical science. The first suggestion of the clinical value of weighing the fluids of the body and measuring the frequency of the pulse and respiration in disease and health by means of a klepsydra or water clock was Cardinal Nicholas of Cusa who was at the time in Italy, and was greatly influenced by the Italians. This suggestion came before its time and bore no fruit and it was Galileo who in the midst of his experiments with a pendulum, next came to the thought of measuring the rate and variation of the pulse by means of a pendulum, after having first hit on the idea of using his pulse beats as a measure for the pendulum swings. Galileo's contemporary Santorio took advantage of these suggestions of Galileo to fashion various instruments for clinical diagnosis and he describes a clinical thermometer and a *pulsilogium* or pulse clock for the measuring of the human temperature and pulse. He invented a series of clever instruments, the best known of which are the trochar and canula and various apparatus for extracting stones from the bladder and foreign bodies from the ear. But these instruments belong in the domain of surgery and more is said of them in the chapter on that subject.

Sanctorius was also the inventor of ingenious means of giving patients baths without removing them from bed and various arrangements for external and internal hydrotherapy. In recent years he has had renewed reputation because he was the first to attempt definite accurate experiments on nutrition. The Frontispiece of his *Ars De Statica Medicina* represents Sanctorius seated in his steelyard chair weighing himself for a metabolism experiment after a meal.

How complete and detailed Italian observations in medicine were, may be gathered from the fact that shortly after the middle of the sixteenth century, Ulysses Aldrovandi, professor of natural history in Bologna, treated the subject of intestinal parasites of men in considerable detail in his book *De animalibus insectis, libri septem*. In the next century Redi the biologist who occupied himself very much with the subject of spontaneous generation, denying its occurrence,



SANCTORIUS ON THE STEELYARD.

because so far as his observations went all living things proceeded from preceding life, studied the parasites of animals and experimented with methods of treatment for intestinal parasites of various kinds. Other Italian writers, Vallisnieri, Morgagni, Thaddeus Dunus who described the *bothriocephalus latus*, and Panaroli who in 1650 seems to have found a *cysticercus* in the brain of an epileptic, made acute observations that gradually led to the development of our knowledge of these parasites.

How well Redi understood what is usually supposed to be a much more recent discovery in biology, the development of life only from preceding life, is clearly manifest from his formulation of the principle *omne vivum ex vivo*. He had been investigating putrefaction and the occurrence of living things in the midst of putrefying substances, but emphatically declared that life never came from death, but always from preceding life. Father Kircher working in Italy about the middle of the seventeenth century gave in his *Scrutinium Pestis* (Rome 1658) the details of seven experiments upon the nature of putrefaction showing how maggots and other living creatures are developed in decaying matter. He applied these observations to the question of contagion and came to the conclusion that the infectious diseases were caused by *contagium animatum*, that is by living contagious materials.

Italy's place in preventive medicine, that all important practical side of medical science, is scarcely less important than in other departments, but it is oftener ignored. The question of tuberculosis will illustrate this. At many times in the Italian peninsula subsequent to Galen, ideas anticipating what is most modern in our knowledge of the disease came to be generally accepted. As early as the fifteenth century certain of the Italian towns organized boards of health and arranged for quarantine for the prevention of the spread of epidemics. A century or so later they began to declare tuberculosis contagious and required the destruction of the clothing of the tuberculous after their death and the thorough cleansing of

their rooms. About the middle of the eighteenth century Morgagni refused to make autopsies on tuberculous subjects because he was sure that the disease was contagious, and declared that he had noted its transfer as a consequence of dissection wounds. About this same time Naples and the States of the Church both declared the disease contagious, and made a series of sanitary regulations to prevent its spread. These precautions with regard to the disease, scoffed at not infrequently as barbaric by other nations, led to a great reduction in the death-rate from it and as a consequence of this the Italians apparently forgot about the danger of it, allowed their sanitary laws to fall into abeyance and tuberculosis once more became a serious danger.

Italy has done much in the modern time to care for the health of her people. Malaria was the great scourge allowed to creep in when its cause was not understood. A whole series of interesting experiments were made in order to reduce it, though not until the modern proper understanding of the mode of diffusion of malaria were these successful. The Italians recognized that waste spaces were somehow breeders of malaria and therefore encouraged the re-growth of forests. They did not realize that the main reason why forests lowered malaria morbidity and mortality was by preventing the presence of surface water in which mosquitos would breed. They grew eucalyptus trees in large numbers and these by absorbing moisture had a similar beneficent effect on malaria. Rome has gradually become from one of the most deadly of cities for foreigners because of the dread Roman fever, one of the healthiest large cities of Europe and indeed a great health resort for invalids. It is very rare now for a visitor to Rome to be stricken with Roman fever. Almost needless to say these represent distinct triumphs in hygiene and sanitation carried out with determination and great practical ability.

In popular estimation, therapeutics, or the cure of disease, is the most important department of medicine. The physician knows that in this there is more danger than elsewhere of being led astray for cures are fallacious. The herbal remedies, however, very early received serious attention in

MEDICINE

Italy and were experimented with until demonstrations of their value or insignificance were reached. An immense number of remedies were thus employed, some of them quite inert and some of them of thoroughly practical value.

One of the significant medical developments in Italy was the establishment of *Herbularia* in connection with the monasteries. This began very early among the Benedictines for the brother infirmarian was expected to care for the health of the brethren, and to plant and gather simples for this purpose. All the old traditions point to the knowledge of the monks in this regard. As the monasteries became more important in the world of the time, and many of them gathered a numerous peasantry in association with the monastery, living on the monastic lands, it was understood that their health also should be cared for by the monks. Hence their "physick" gardens became larger and more important. The experience of the various monasteries was communicated to the Brethren in distant places and they exchanged seeds of various kinds and pharmaceutic products. The Benedictine nunneries had the same customs and so it is not surprising to find the most important book on medical subjects in the twelfth century written by the Abbess Hildegarde of a Benedictine nunnery along the Rhine. The original Italian traditions had been preserved and developed as they wandered Northward. We know that there was a *Herbularium* or *Physick Garden* at the Monastery of St. Gall as early as the ninth century. After all, the epochmaking work of Abbot Mendel which has attracted so much attention in recent years, was done in a monastic garden not unlike those in which the old-time Italian monks cultivated the various plants, noted their peculiarities, learned to grow the best varieties and passed on this precious knowledge to the peasantry near their own monastery, and to the other monasteries with which they were in communication.

With the development of University medical schools the field was already cultivated for the establishment of botanical gardens in connection with them. The first formal creation of a University Botanical Garden was that at Pisa which

began in 1544. The following year Padua established a similar Botanical Garden, and among its Prefects were the eminent botanists, Anguilara and Prospero Alpini. It very soon became the custom to make yearly demonstrations of the living plants for the students in order that they might be able to recognize them. Pharmacy thus came to have as practical teaching as clinical medicine and during the second half of the sixteenth century Zurich, Leyden, Leipzig and Paris followed the example set by Pisa, Padua and Bologna. It was only during the seventeenth century that other universities acquired their botanic gardens.

The use of herbal medicines was not followed blindly in Italy, however, and above all there was a very definite anticipation of our modern use of natural curative methods. They were brought into vogue under the influence of the first great medical school of modern times, that at Salerno, where this special evolution of medical practice makes it very clear that the Italians of the later Middle Ages had thrown off Arabian domination in medicine and were thinking for themselves. Earlier in the Middle Ages the Arabs with the advantage of close touch with Greek medicine in the towns formerly the seat of Greek schools of medicine, which they had captured in Asia Minor, were naturally the most important practitioners of medicine and writers on medical science until the tenth century. Unfortunately their Oriental mystical tendencies led them to distrust nature and tempted them into the use of many drugs until their polypharmacy became absurd in its multiplicity. Physicians prescriptions looked so much like lists of the days of the month because of the many ingredients in them that no wonder they were called "calendar" prescriptions. Somehow it was thought that if a great many drugs were given, someone of them would be sure to do the patient good. The fact that the others might at the same time be doing harm scarcely seems to have occurred to these enthusiastic drug givers. Long afterwards we had the "gunshot prescriptions" of the eighteenth and early nineteenth centuries which represented a reversion to the old crude therapeutic

MEDICINE

ideas, in spite of Italian conservatism having eliminated one phase of such generic treatment.

In medicine the Italians of recent years have at least maintained the reputation of their nation. Banti's disease is called after the Italian discoverer because of merited recognition of the fact that here was a fine description obtained by the most careful clinical observation of a symptom complex, the varying parts of which had never been put together before. In malaria the contributions of Italians have been extremely valuable and have been eminently practical. They have done much to make many districts supposedly uninhabitable because of the presence of malarial organisms not only possible for human life but even wholesome and healthful. We owe to them the study of the life cycle of the *plasmodium malariae* discovered by Laveran and the differentiation of the various forms of the parasite which cause the varying kinds of the disease. Their work in tuberculosis has been scarcely less valuable than in malaria and some of it has attracted attention throughout the civilized world. Mosso's work on fatigue, Lombroso's work on the criminal and many other Italian contributions to medicine though eventually proving not conclusive but only stages in knowledge, have been immensely valuable because of their suggestive quality, and the incentive they furnished to the work of others.

Often when other names have become attached to medical phenomena it is surprising to find that the original discoverer was an Italian. This is well illustrated by the development of our knowledge of observations with regard to exophthalmic goitre. The affection is often spoken of as Graves' Disease because that distinguished Irish physician called attention to the association of heart palpitation with goitre. The name of Basedow is associated with the disease because he described also the third symptom that occurs in the affection, the prominence of the eyeballs. This was not, however, until 1850. The Roman physician Flajani had, however, described the disease as early as 1802, and Italians have rightly protested

that if any name should be associated with it it ought to be his.

The prominence of Italians in very recent work in medicine can be very readily seen from the number of names of Italian investigators who have found their way into the bibliography of the trypanosomes. Dr. Garrison in his *History of Medicine* mentions Castellani, who saw this organism in the cerebro-spinal fluid and blood of five cases of African sleeping sickness. The piroplasms or babesioses of the dog were studied by Piana and Galli Valerio. The bodies found in the central nervous system in hydrophobia by Negri and called after his name have attracted much attention, and yet now after over forty years we have not added much that is definite to the observations made by him. The work of finding protozoa in small-pox and other familiar diseases whose microbial causes have not yet been absolutely worked out was initiated by Guarnieri with his study of *Cytoryctes variolae* in 1894. When the spirochete of African relapsing fever the familiar tick fever was discovered in 1904, one of the independent discoverers was Nabarro an Italian.

In our own time Italy's leadership in the solution of medical as well as social problems is very well illustrated by the fact that the city of Milan has erected the first hospital and clinic for occupational diseases. The "safety first" movement which has properly attracted so much attention and which is not only an important social advance but presents a serious indictment of our nineteenth century industrial progress has come in everywhere with a rush, yet as suggested by Dr. Gilman Thompson in his volume on *Occupation Diseases*, (New York Appleton 1904) the Milan Hospital and Clinic for Occupation Diseases is not only the first in the field but it represents a complete institute for its purpose with a staff of twelve research investigators and a series of extension departments. Arrangements are made for visiting the homes of workers when for any reason they can not or will not come to the dispensary or hospital, leaflets of instruction on the avoidance of the dangers of occupations as regards both injuries and

disease are issued, popular conferences on these subjects are held, there is special instruction of students on all the subjects related to the "safety first" movement and physicians are trained as experts and specialists in this work.

The statistics from this clinic for 1910, 1911 were published in *Il Lavoro* (Milan 1911) and constitute a most valuable contribution to our knowledge of this subject. It is of course not surprising that Italy should prove a pioneer in this subject in the modern time, for some of her great surgeons of the medieval period and later in the Renaissance time dwelt on occupation injuries, though not in the specialized way of the modern time. In 1713 Bernardino Remazzini published at Padua the first book on the diseases of workmen which called emphatic attention to the abuses that existed in many occupations. His *De Morbis Artificum Diatriba*, the title literally translated would be "Diatribes on the Diseases of Workmen," aroused considerable attention and represents pioneer work in this direction that was of great value. Unfortunately it was lost sight of however, in the decadence of education which occurred during the eighteenth century in the midst of which the use of Latin as the common tongue of professional men and especially physicians ceased, and the confusion of tongues incident to vernacular authorship of medical works set the nations out of touch with each other in medicine for a full century.

SURGERY

SURGERY is usually supposed to be a very modern development of medical science. Ordinarily it is assumed that so little was accomplished by surgeons before the last two or three generations that the history of surgery up to the middle of the nineteenth century is scarcely worth while talking about. It is quite frankly conceded that men were doubtless quite willing and even anxious to make surgical advances, but with a very imperfect knowledge of anatomy consequent upon opposition to dissection, emphasized by the awful pain that was inflicted by surgical procedures without anaesthesia and involving the prohibitive risk of complications and even death from almost inevitable septic complications after operation, what wonder there was almost no successful efforts made for the development of surgery. With the evolution of surgery as a science thus definitely presumed to have come only in quite recent years since Italian names are not particularly prominent in it, it would be natural to conclude that at least in surgery the world owes Italy no special debt. Probably nothing shows better the almost universal failure properly to appreciate the history of other times and other countries than an impression of this kind for the chapter on Italian surgery is one of the most important in the book.

One of the greatest surprises of the recent developments in historical knowledge has been the gradual accumulation of information from old time text books, which shows us very clearly that far from this being the first time in the world's history that there has been a great development of surgery, quite on the contrary at a number of times men have done magnificent work in this specialty, and accomplished nearly

SURGERY

as much as we have even in our time, which represents a climax of successful devotion to surgical progress. Above all there was a period during the thirteenth and fourteenth centuries when the great Italian Universities had a series of professors who accomplished almost incredible advance in surgery and left not merely traditions of their achievements, but extended text books in which for the benefit of their students, who came from all the Western world, they described in detail what they had succeeded in doing. These are classics in the history of surgery, which after being reprinted in the Renaissance, were neglected until almost our own time. These great surgical teachers invented several methods of *anaesthesia*, they obtained union by *first intention*, using *strong wine as an antiseptic*, and they succeeded safely in entering every cavity of the body in order to relieve pathological conditions of many kinds existent in them. Even tumours were removed from the brain, the thorax was opened and many abdominal operations were performed.

The names of the great Italian surgeons of the thirteenth and fourteenth centuries are now well known by all who have paid attention to the history of medicine. Modern surgery began at Salerno in the latter part of the twelfth century and very soon the influence of the great Salernitan teachers was felt all over the peninsula. As Arabian influence was strong in the Mediterranean regions at this time it has sometimes been declared that it was really through the Arabs that Salerno became so famous for medicine and that surgery developed so thoroughly. Gurlt, who is acknowledged as the authority on this subject, in his great *History of Surgery* (Vol. 1 page 701) contradicts this supposition emphatically, and says with regard to the first of the great Italian writers on surgery, Rogero, that "Though Arabian works on surgery had been brought over to Italy by Constantine Africanus a hundred years before Roger's time, these exercised no influence over Italian surgery in the next century, and there is scarcely a trace of the surgical knowledge of the Arabs to

be found in Roger's works." Instead of any Arabisms being found in his writings many Graecisms occur.

The fact of the matter is that in the Southern part of Italy which in older times had been called Magna Graecia, Greek influence lived on, and the Greek writers were consulted in the original almost as soon as Salerno began to develop its medical teaching. Two great masters in surgery were already recognized in Italy early in the thirteenth century. Their names, Ruggiero and Rolando, sound so romantic that many have thought of them almost as myths. They were very real and above all practical. The book of Ruggiero or Roger as he is called in English, rests almost entirely upon his own original observations and those of his colleagues. As he himself says in the preface "We have resolved to write out deliberately our methods of operation, such as they have been derived from our own experience and that of our colleagues and illustrious men." He probably wrote his text book toward the end of the twelfth century. It was commented on by his pupil Rolando and subsequently enlarged and annotated by "The Four Masters." Almost in its original form Roger's book was reprinted by De Renzi in his *Collectio Salernitana*. It is comparatively easy now to read either the complete originals of these books, or the abbreviations made by modern historians of medicine, and above all by Gurlt, and thus to learn at first hand how many startling anticipations of what is most modern surgery are to be found in these old authors.

The Four Masters represent in that older time such a collaboration in text book making as has become familiar in our "systems" of medicine and surgery. Their teaching was very practical. Wounds of the head for instance were treated of in great detail, and with a thorough knowledge manifestly founded on experience. They warned the young surgeon not to conclude because the scalp was unbroken that therefore there was no fracture of the skull. When the instrument inflicting the wound was blunt, of heavy metal like the clapper of a bell, or a large key, or a rounded instrument made of

lead, — an anticipation of the lead pipe of the modern time, — they said that there might be fracture of the skull without penetrating wound of the scalp. If the symptoms were severe they even suggested the advisability of exploratory incision. With a fracture present, if symptoms of compression developed they must be relieved without delay by trephining and raising the depressed bone. They were quite familiar with fracture by what is technically called *contre coup*, for they declared that “quite frequently though the percussion comes in the anterior part of the cranium the skull is fractured in the opposite part.” They knew of the possibility of internal hemorrhage from lacerated intracranial arteries and tell the story of a youth who had a very small wound made by a thrown stone; after the primary shock was recovered from there seemed no serious results or bad signs. He died the next day however. His cranium was opened and a large amount of black blood was coagulated about his dura mater.

They warned of the danger of infection and Gurlt quotes a very striking expression “in elevating the cranium be solicitous lest you *infect* (Italics Gurlt’s) or injure the dura mater.” On the day when a trephining was to be done the physician was warned that “his hands must be clean, that he must avoid the taking of food that may corrupt the air such as onions, leeks and the like, that he must avoid contact with menstruating women” and in general must keep himself in a state of absolute cleanliness. These men were above all observers, and they had noted the bad effects which followed from neglect of these precautions. They had reached a virtual anticipation of our nineteenth century principles of aseptic surgery. This is not a far fetched explanation meant to magnify the reputation of medieval Italian surgeons, but a simple estimation of their real achievements, to which any reader who knows their books and actual observations is forced by the evidence. Gurlt, in a few pages supplies quite sufficient details of information to show this very clearly.

After these South Italian surgeons came a series of North Italian surgeons, worthy successors who surpassed even

Salerno's prestige. The greatest were Bruno of Longoburgo, Theodoric and his father Ugo of Lucca, William of Salicet and Lanfranc, his name was really Lanfranchi, the last practised for a time at Milan in Italy, afterwards taught in Paris and laid the foundation of French prestige in surgery. These men developed anaesthesia and antiseptis, greatly increased the scope and field of surgery and lifted the specialty up into a thoroughly scientific department of medicine. They studied putrefaction rather carefully, recognizing how much it meant for their success or failure in surgery, and they developed wonderfully the technique of operative intervention. Gurli in his *History of Surgery* gives some fifteen octavo pages of rather small type to a brief compendium of Bruno's teaching on surgery alone. Ugo of Lucca was the city physician at Bologna early in the thirteenth century, and he became the medico-legal expert of the municipality. The civic statutes of Bologna are the oldest monuments of legal medicine in the Middle Ages. Ugo lived to be nearly one hundred years of age and three of his five sons became physicians. One of them, Theodoric, who afterwards was made a bishop, set himself the task of writing out his father's teachings. In this he left a monument not only to the surgery but the medicine of the time, for his father had occupied himself somewhat in the study of anodyne and anaesthetizing drugs, and is said to have been the first who taught the sublimation of arsenic.

Theodoric comes nearest to the moderns of all these old surgeons, and his teaching with regard to the cause and meaning of the infection of wounds is distinctly modern. I suggested in my *Old Time Makers of Medicine* in the chapter on Great Surgeons of Medieval Universities, that Theodoric's expressions in a passage like the following, are full half a millenium before what is usually presumed to be the origin of such ideas. "For it is not necessary, as Roger and Roland have written, as many of their disciples teach, and as all *modern* (sic) surgeons profess, that pus should be generated in wounds. No error can be greater than this. Such a practice is indeed to hinder nature, to prolong the disease, and

to prevent the conglutination and consolidation of the wound." The italics in the word "modern" are mine and are meant to call attention to the fact that the whole expression might well have been used by some early advocate of antiseptis or even by Lord Lister himself. Six centuries almost to the year would separate the two declarations, yet they would be just as true at one time as at another. When we learn that Theodorie was proud of the very beautiful cicatrices which resulted without the use of any ointment, *pulcherrimas cicatrices sine unguento aliquo inducebat*, then further that he impugned the use of poultices and of oil on wounds, while he declared powders "too drying" and said that besides they had a tendency to prevent drainage,—the literal meaning of the Latin words he employs *saniem incarcerare* is "to incarcerate sanious material"—it is easy to understand that the claim that antiseptic surgery was anticipated six centuries ago in Italy, is no exaggerated and no far-fetched explanation with modern ideas in mind of certain clever modes of dressing wounds hit upon by fortunate accident by mediæval Italian surgeons.

William of Salicet was a pupil of Bruno's and the master of Lanfranc, who though himself an Italian was the Father of French Surgery. Salicet was a thoroughly observant physician and a skilled surgeon, who was practical enough to find always the simplest way to practice surgical intervention and who knew enough of his anatomy to know how to relieve many hitherto intractable conditions. Above all he had the surgical audacity to tackle difficult problems and solving many of them successfully has left a great name in the history of surgery. Professor Clifford Allbutt of Cambridge has praised him highly, and Gurlt has given him some ten pages of rather small type in his *History of Surgery*. The one thing interesting for us is that William depended much more on the findings of his own experience than on anything he found in the text books. His own work then is remarkable for its originality and quality. He devoted six chapters to diseases of the eye and the eyelids, two chapters to the affections of

the ears and several chapters to the nose and mouth. He treated *ranula*, *epulis* and polypus by extirpation, and recognizing their tendency to recur, suggested the use of cauterizing substances such as vitriol powder, or alum with salt, in order to produce such inflammatory changes as would obliterate the base of the lesion and thus prevent recurrence. He thought it better to allow swollen cervical glands to remain than to operate on them and suggests that internal medication and building up of general health is better than operative procedure. In his experiences the surgeon secured much better ultimate results from allowing these enlarged cervical glands to open of themselves, if they would, than to operate on them. It is worthy of special note that after much meddlesome surgery we have to a very great extent come back to William's conservative conclusions with regard to the best treatment of this condition in the modern time.

Lanfranc, known for his teaching in Paris and bearing what looks like a native French name is seldom thought of as an Italian, but he was born in Northern Italy of Italian parentage, the family name being, as we have said, Lanfranchi. He studied under William of Salicet at Piacenza, practiced in Milan until he was banished by the Visconti, and then having succeeded in making a reputation for himself in Lyons was called to Paris to teach in the University medical department. He is a favorite author of Gurlt's who gives him more than twenty-five closely printed large octavo pages in his *History of Surgery*. Anyone who wants to learn how deserved is Gurlt's admiration for this great Italian Professor at the University of Paris should read those pages. Lanfranc knew the literature of surgery up to his time very well and quotes altogether more than a score of writers on surgery who had preceded him. On the other hand there is scarcely an important surgical topic with regard to which Gurlt does not report some interesting observations made by Lanfranc from his own personal experience.

The next great European surgeon, Guy de Chauliac, having made his studies in Italy frankly acknowledged his obliga-



VERROCCHIO COLLEONI

tions to the Italians. While he well deserves the name of Father of Modern Surgery in a certain sense, it is not because he was the originator, but because he was the brilliant genius who closed a long and interesting line of contributors to surgery and gathered together all their combined experience in his great text book of surgery *La Grande Chirurgie*. In this he quotes freely from his teachers in Italy and from Lanfranc with whom he was for some time at the University of Paris. After reading his text book it is easy to understand why Friend the great English physician and father of English medical history calls Chauliac the Prince of Surgeons, yet he himself was unstinting in the acknowledgment of his obligations to his Italian masters.

In order to appreciate properly how much the Italians have accomplished for surgery one should turn, as I have said, to a work such as Prof. Gurlt's *History of Surgery** As a thorough German of the modern time, himself a distinguished surgeon and professor of surgery at the University of Berlin, he is not likely to exaggerate the accomplishments of old-time surgeons nor to magnify beyond their deserts what the Italians have done. He devotes many hundreds of pages to an account of the writings of Italian surgeons and makes it very clear that they were the teachers of the world. Men of other nations did good work in surgery but usually under the inspiration of the Italians, either taught directly by them or by a surgical tradition that had been originally drawn from Italian sources. The surgeons of the Renaissance alone occupy some two hundred pages of his monumental work. There is scarcely a distinguished anatomist of this time in Italy who was not also a contributor in some way to surgery. Some of those whose names we are accustomed to associate more with physiology than with any other department of medicine, such men as Caesalpino, Fallopio, Botallo, Aranzi, Fabrizio da Acquapendente, to give them the Italian forms of their names, under Gurlt's penetrating study prove to deserve a place in

* Geschichte der Chirurgie und Ibrer Ausübung von Dr. E. Gurlt III Band, Berlin, 1898.

the history of surgery and represent important links in surgical development.

The Italian surgeons of the Renaissance period bravely undertook nearly all the striking surgical interventions that are sometimes supposed to have been reserved for our more progressive time. The bone surgery of the Renaissance is particularly interesting. Fallopius insisted on the preservation of the periosteum of the bone just as far as possible, for this would bring about regeneration. The older methods of using force for the reduction of dislocations yielded place to the maxim that the joints should be restored along the same path through which the dislocation took place. Vigo described fractures of the inner table of the skull when the outer table is unbroken and Argelata described depression without fracture as occurring in children or those who had not attained their growth. Helferich's chapters on the *History of Surgery* in Puschmann's *Handbook of the History of Medicine* shows how many discoveries and rediscoveries and inventions and re-inventions were made in the course of time, and how almost without exception the Italians were the first to put most of the original ideas into practical use.

These surgeons brought severed tendons together, treated the various deformities by rational methods instead of force, corrected defective limbs, designed corsets and various apparatuses for orthopedic purposes, invented gold and silver tubes to be used after tracheotomy and developed all of the specialties. Savonarola, the grandfather of the martyr Dominican of that name, suggested the extirpation of ranula and recommended the puncture of the pleural cavity for effusion. Della Croce taught that pathological fluid should be emptied out of the thorax by aspiration and Arculanus laid down the principle of drainage from the most dependent portion. Cabral declared that wounds of the heart were not necessarily fatal and tells of one that he had treated successfully and afterwards seen healed at autopsy when death took place from another cause not long after. Fioravanti reported a case of splenectomy with the recovery of the patient; Berengar of

Carpi detailed some cases of *extirpatio uteri* for *procidencia* and developed the technique of inunctions of mercury for *lues*. Fallopius described union by first intention as resembling that which occurs between two waxed surfaces when they are brought together and adhere. Fabricius of Aquapendente and many others suggested various means of curing club foot.

The Italians were famous for their work in plastic surgery. Those of the fifteenth and sixteenth centuries alone accomplished some wonderful things. The general public is not inclined to be so much interested in plastic surgery, that is the remaking of tissues and the facilitation of function by operations upon diseased or injured parts, as in the sensational operations by which life is saved by mutilation, but surgeons themselves recognize that the members of the profession who do this work successfully are among the most inventive, patient, and progressive surgeons at all times. The Italians have actually left very little for others to invent in this specialty and their employment of soft tissue and bone grafts of all kinds anticipated such uses by any others, long before the surgeons of other countries took up the subject. In our time the great increase of industrial injuries and automobile accidents with consequent maiming, as well as the unfortunate crippling of such chronic diseases as tuberculosis in our overcrowded cities have attracted special attention once more to the subject of plastic surgery. Some of the most important sessions of a recent International Congress of Surgeons in New York were given up to this subject. Surgeons themselves have come to recognize the surgery of repair as almost more important than life saving surgical intervention for emergencies. Our own renewal of interest in this subject which saves so much human suffering has made us realize better than anything else what work was accomplished by the old time Italian surgeons, often under very discouraging conditions, and how much honor they deserve for it.

In the chapter on surgery in my book on *The Century of Columbus*, the story of what the Italians did for surgery during the fifteenth and sixteenth centuries is dwelt on in suffi-

cient detail to show their really great achievements. Here only some of the most interesting anticipations of what is sometimes thought of as the most recent developments in surgical technique will be mentioned. The Brancas, father and son, invented and developed the method of making new noses for those who had unfortunately lost those important organs through the many sword wounds of that time. Later on another Italian, Tagliacozzi, applied their technique to such an extent that his name became known throughout Europe, and not always favorably, because the popular impression seems to have been that it was not quite right for anyone to try to improve the appearance of human beings, as if it was an interference in the domain of Providence. An Italian of the early fifteenth century suggested the employment of the trachea of animals for intestinal surgery for large wounds and especially complete divisions. The freshly removed trachea was to be inserted in the intestines so that the lumen of the intestinal canal might be maintained. The cartilaginous trachea would gradually be absorbed in the secretions but not before complete agglutination of the divided intestines had taken place. Italian surgeons also experimented with metal tubes of various kinds for this same purpose and anticipated practically all the inventions, the Murphy button, the bone plates and the like that attracted so much attention in this line in recent years.

With the beginning of the Renaissance there was a great new awakening in the surgical specialties in which Italy took the leading position as she did in every other phase of Renaissance achievement. It is curiously interesting to note how much was done for all the specialties at this time. Even dentistry of which we are inclined to think that there was almost nothing of value known, and less practised, until our own time, developed to a noteworthy degree and John of Arcoli, or Arculanus, as he is often known by his Latin name mentions the filling of teeth with gold. About this time also the Italians were wont to use tin for the filling of dental cavities. Interestingly enough tin has be-

gun to come unto use again in the modern time and has proved to be eminently useful because it does not oxidize readily and the salts that are formed from it are rather preservative for the teeth than otherwise. Arculanus who was a professor of medicine and surgery at Padua, about the middle of the fifteenth century, gives a number of directions for the care of the teeth and details of the technique of their repair. Guerini in his History of Dentistry says that the subject of dentistry is treated by Arculanus rather fully and quite accurately. Arculanus has a number of chapters on the treatment of diseases of the mouth and nose.

A very great Italian surgeon to whom Gurlt has devoted more than a dozen of pages is Carcano Leone who when not yet twenty years of age and while still making his medical studies, received an invitation to become a surgeon in the Artillery Corps of the Spanish Army which the Duke of Alba had brought to the siege of Santhea in Piedmont. It was not easy to obtain surgeons and in spite of his limited experience, his work gave so much satisfaction that he was made a surgeon major. Instead of this turning his head he insisted that he should be given a leave of absence in order to perfect himself under Fallopius. This was granted him and prepared him for a magnificent life work. Fallopius would like to have had him succeed himself some years later in the chair of anatomy at Bolognà, but the professorship was given to Fabricius da Aquapendente. When he was thirty-seven, however, Carcano Leone succeeded Cuneo as professor of anatomy in Pavia and then took the opportunity to write his great book on wounds of the head which went through many editions and which Scarpa valued so highly that he recommended its study to his contemporaries nearly two centuries later.

The Italian development of care for gunshot wounds is of itself a triumph of surgical development and the finest evidence of their power to face and solve difficult problems. Up to the employment of firearms, wounds had been made with cutting or crushing instruments and now came the very

different—perforating lead bullets. At first it was thought that these were both burning and toxic in their effects, searing and poisoning the tissues which they penetrated. A series of experiments were made to decide these important questions in what can not help but be recognized as the most thoroughly scientific temper. Maggi (1516-1552) the Italian surgeon showed that leaden balls do not melt when they strike a hard surface and besides are not in the state of high temperature in which they had been generally presumed to be while travelling through the air, because of the heat developed by the exploding powder which originally drove them or of the friction of the air through which they passed. Even balls of wax that are fired do not spread out as if the wax were melted. Lead bullets do not produce burned wounds, because they are not superheated as is usually supposed. He showed by actual experiments that such bullets may be fired through a bag of gunpowder without causing it to explode.

This whole series of experimental observations made by Maggi is a triumph of the Italian surgery of the Renaissance. Gurlt in his *History of Surgery* compares the conclusions drawn by Maggi from his experiments in the early sixteenth century with those reached after the discussion of the same subject following a series of experiments made after the Franco-Prussian War. He does not hesitate to say that the old time Italian surgeons anticipated practically all of the conclusions of the modern time. He devotes some eight pages to Maggi's work on gun-shot wounds and describes his experiments at some length. Maggi had fired balls made of sulphur out of guns without setting them on fire, pointed out that the paper wads used in guns were not singed much less set on fire, called attention to the fact that the wound of entrance had the same appearance as the wound of exit in gun shot wounds in spite of the fact that if the ball had been hot on entrance it would be cooled in the tissues; and though when shots were fired very close clothing might

SURGERY

be set on fire from the flash, this was due to the burning powder and not to the heat of the bullet.

The surprise is how many things discovered by the Italians of earlier days were somehow forgotten later and had to be rediscovered. This is of course true of all history. It is not the progress of mankind that is most interesting, for there is very little evidence for that, but the mystery of subsequent oblivion, for the careful student of history, constantly finds that men discover things and then afterwards for some reason forget about them. The greatest development in surgery in our time has been due to Lister's work with antiseptics and the subsequent evolution of aseptic surgery out of his genius initiative. It is curiously interesting to find that Michelangelo Biondo, sometimes known by his Latin name of Blondus, taught the use of hot water as the only proper application to wounds early in the sixteenth century. In my book on *The Century of Columbus* (N. Y. 1914) I have summed up some of his expressions which show the solution of the most important problem of surgery by an Italian nearly four centuries ago.

Biondo tells of some physicians of his time who, in place of liniments and all the various applications that are made by the "wax-dealers" simply wash off their wounds with warm water. He adds that these physicians insist that a great many surgical patients are not killed by their disease so much as by the custom of allowing them only small amounts of food and the unfortunate effect produced by the well meaning, but mistaken materials applied to their wounds. He adds further that the successful surgeons are not wont to treat patients suffering from fevers by keeping them on a light diet, but on the contrary they give them wine and nourishing food instead of slops (ptisans.) His comment is that this sensible method of supporting treatment unfortunately does not make much headway in the profession. Apparently it was too simple and natural to appeal to the physician of the time. He adds with a touch of modern irony "It is said to be preferable to die in accordance with accepted

methods than to live empirically." Gurlt gives some further details of Biondo's treatment of wounds. After the staunching of the bleeding, the wound was to be cleansed and then covered with *oleum abjetinum*, very probably a mixture of oil of turpentine one part, to two parts of oil of roses. With regard to the use of water in the treatment of wounds, Biondo said: "The most experienced of the older physicians hold water in such dread that they would scarcely use it in removing dirt from the neighborhood of wounds. I myself however, having seen the wonderful effect of water in wounded parts, can not help but be amazed at its supercelestial virtue." In spite of this emphatic declaration of his own observation, even Biondo himself in his book gives chapters on all the old methods of treating wounds and the various applications that were supposed to work wonders in bringing about healing. The consequence was that the water doctrine was pushed into the background and probably attracted very little attention. Here was much more than the germ of a great discovery, the actual recognition of the full value of the use of boiled water for wounds evidently reached by the most careful observation, yet it was destined to oblivion instead of the hearty appreciation that it deserved, and its true value was to remain hidden until four centuries and a half later after Lord Lister's antiseptic teaching had cleared the way, when the further step, the doctrine of asepsis gained firm foothold.

Aranzi, whose name is usually connected with medicine rather than with surgery and who is famous for his anatomical observations in his monograph on the human foetus, did many things in surgery worthy of note. Long before Tagliacozzi he practiced rhino-plasty, that is, the rebuilding up of deformed or defective noses, and taught his students in Bologna the principles by which this could be best accomplished. He invented a form of nasal speculum of which Gurlt has quoted the description, he made a series of original observations on the nose and throat, and on tumor. Strange as it may seem to those who think of this as peculiarly a modern specialty, he made many advances in genito-urinary diseases.

One of Aranzi's great contemporaries was Jerome Mercurialis who wrote a series of books on such specialties as skin diseases, gynaecology, pediatrics and toxicology, and yet made distinguished contributions to plastic surgery and published that very popular book which went through so many editions in various countries, his *De Arte Gymnastica*, in which he treats of all the manipulations and exercises by which curative results may be secured. After such success in his studies as portended his future success, Mercurialis was sent at the age of thirty-two on a mission to Pope Pius IV at Rome and found such excellent opportunities for his scientific studies there that he remained for seven years and attracted so much attention by his researches in medicine and his writings that he was invited by the Venetian Senate to become the successor of Trincavalla at Padua, where he remained for nearly twenty years. Afterwards he was for sometime Professor of Bologna, a post which he owed to the rivalry between the two Italian universities. He taught eventually at Pisa, which the grand Dukes were trying to make the seat of the most important University in Italy. Mercurialis was probably the greatest consultant physician of his time, was once summoned to see Kaiser Maximilian II in Vienna, and as a consequence of his reputation made an immense fortune from his profession.

A typical example of the inventive genius of Italian surgeons is Santorio, sometimes known by his Latin name, Sanctorius, who became professor of theoretic medicine at the age of about fifty, after he had been for many years in practice in Venice. His best known work is his *Aphorisms of Static Medicine* (*De Medicina Statica, Aphorismi*) which went through some two score of editions and translations from his time down to the middle of the eighteenth century and gave him a European reputation. He made a series of observations in which he demonstrated the occurrence of insensible perspiration, and the ingenuity required for this gives an excellent idea of his power of observation and his persistence in investigation.

What he is famous for however, is his invention of instruments of various kinds to be used in medicine and his application of various inventions to medical purposes. According to Gurlt, Santorio was the first to make use of the thermometer and hydrometer in order to determine variations in vital phenomena. He had great mechanical talent and invented a sphygmometer, *pulsilogium* or pulse measure was the name he suggested for it. He was the inventor also of an instrument anticipating the trocar and canula with a tube and projecting needle which he used for the opening of the air passages in case of suffocation due to obstruction in the upper air tract. He describes his method as follows:

“For infants and adults who suffocate, if no other remedy avails, perforation with our instrument made below the larynx recalls the patient from sudden death to sudden health, provided suffocation is due to anything above the larynx or the point of perforation. If the obstruction is below or in the lung itself the instrument will not avail.”

His description of the instrument and his insistence on the necessity for there being no roughness where needle and canula meet “so that they may seem to be one and not two” in order to avoid lacerating tissues, his detailed directions as to the position that must be assumed by the patient as well as of the proper point of the puncture and of the necessity for not wounding the back wall of the trachea, with the way to avoid this, all show his thoroughly practical genius. He declares that the instrument is actually life saving in *angina suffocante*, probably diphtheria, and adds that if it were allowed to use it on those who were being hanged it would save them from suffocation. The canula is to be allowed to remain so as long as the difficulty of breathing persists. A similar form of instrument is described also for abdominal puncture and the removal of fluid.

We have pictures of various hospital appliances that were invented by Sanctorius. He describes a bathing arrangement, for instance, made of leather to be used in bed for those patients who are so weak that it seems inadvisable to get them

out of bed for a bath. Water was admitted into this bathing bag at the back of the patient and allowed to flow out from a tube at the foot of the bed when the bath was finished. Sanctorius' use of this arrangement was for fever patients, and he describes the success he had with it in the treatment of those suffering from hectic fever. Sanctorius was also the inventor of an artificial bed *lectus artificiosus* which had six special purposes. The patient might sit up in it, it had special arrangements for cleanliness, it could be suspended, there was a special table arrangement in connection with it and the patient might readily be transferred to another bed placed beside it while the clothing was being changed. He also improved the dry cups of the times and the clyster apparatuses and other instruments.

He also suggested and has left a picture of a tricuspid instrument for the extraction of vesical calculi. Whether this was ever practically used or not we do not know, though Sanctorius' confident enumeration of the details of the technique of its uses in various cases is most convincing. It is no wonder that his writings were exceedingly popular at this time, and that he came to be looked upon as probably the greatest physician of his day. The other book of his besides the Static Medicine which was famous and went through many editions, bears the inviting title "Method of Avoiding all the Errors which may occur in the Art of Medicine." He wrote, besides, Commentaries on Galen, on the Aphorisms of Hippocrates and a book on The Invention of Remedies.

In every century down to our own time Gurlt finds distinguished Italian surgeons. In the seventeenth century Tagliacozzi attracted wide attention for his plastic work in the restoration of lost noses. Such men as Magati, Codranchi, Settala, Silvatico, Gavassetti, Passaro, Alpino, Cortesi, Santorio, Ferrara, Muratori, Zacchia, Plazzoni, Rossi, Pecetti wrote books on surgery in this century which were widely read, some of which went into second and even third editions and which made them acknowledged leaders in the world's surgery of that century. To most of these in his crowded, yet well

balanced work, Gurlt devotes from three to five pages of rather small type discussing original observations and suggestions that they had made. No one would be given this much space by the great historian of surgery unless he had done work that justified the distinction.

In the nineteenth century the Italians have at least maintained their reputation for great work in surgery, and some of the surgeons' names that are best known by those familiar with the history of surgery are Italians.

Among the great surgeons of the end of the nineteenth century of Italian origin was Bassini, whose wonderfully well planned operation for the radical cure of hernia came to be known and practiced all over the world. It was a masterpiece of technique and probably did more than any other to make it clear to the surgeons of the world that their patients did not need to carry round with them hernia that were dangerous as well as uncomfortable, but that they might be cured and the cure be genuinely radical, so that there would almost never be a relapse. Another one of the great Italian surgeons of our time was Durante who was one of the pioneers in the important department of the surgery of the central nervous system. His contributions attracted the attention of the world and set many a subsequent successful worker in this field to the task of developing nerve surgery. The Italians of our generation have the merit of literally creating the surgery of the heart. The stiletto rather than the revolver is the favorite weapon of the Italian bravo and that has given an opportunity to see and treat successfully many wounds of the heart, until it is universally recognized that not only a heart wound is not necessarily fatal, but that there are wounds of other organs such as the liver for instance that are much more serious.

In spite of the impression that surgery is modern then, and mainly due to great workers in this department in western Europe this review of the work of Italian surgeons made not from vague traditions, but from actual text books, shows very clearly that there have been distinguished Italian

SURGERY

contributors to surgery in every century since the twelfth. The surprise is to find how many valuable advances have been made in surgery that have afterwards been forgotten or relegated to neglect because the men of a particular generation became interested in some new theory or because political and martial disturbances suppressed interest for the time being and necessitated a fresh start. Even the brief account given here will, I think make it very clear that the world's debt to Italy for surgery is by no means the least important of the phases of civilization's indebtedness to the Italians.

MEN OF WORLD INFLUENCE

ITALY has given birth to more men who have influenced mankind deeply and widely and whose personalities have impressed themselves more profoundly on the actual lives of the men and women not only of their own generations, but of many subsequent generations than any other country in the world, not even excepting Greece. These men have exerted the highest influence of all kinds on their fellows. They have been painters, architects, sculptors, musicians, to whom their fellows down the centuries have ever recurred, writers in poetry and in prose, whose works have been sources of inspiration and incentive in all countries, but besides this they have been statesmen, lawmakers, educators, scholars in every department, whose work has lived after them and above all they have been saints, social workers, philosophers, diplomatists, rulers, explorers whose lives are still written because other times have reawakened to their significance. In a word Italians have made exemplary achievements in every phase of human activity and the effect of their example is still felt.

There has but rarely been a century in modern times when some native of Italy has not been attracting world wide attention and his work shaping the destiny or touching the hearts of the men of his time. In many centuries there has been a whole series of Italians, well known beyond the bounds of their own country, and recognized generally as doing the most significant work in the particular department to which their talent attracted them. Not a few of these have been supreme geniuses, unexcelled in their work by any one, seldom even rivalled. Not only is this true more-

over for the men of Italy, but it is true also for the women. In nearly every century there has been one or more distinguished Italian women deeply impressing their characters and personalities on their time and doing work that has not been nor will it be forgotten. Their careers are of such import that a special chapter is needed for them; only after very careful selection and compression can even a few of the greatest of the men be mentioned here.

Above all Italians have stamped their personalities on their own and subsequent generations and have deeply influenced men simply by their force of character and their outlook upon life itself, without any of the significant material or intellectual achievements usually considered necessary to secure an enduring place in history. To take first the men who have influenced mankind in the direction of happiness by the simplification of existence. Italy is particularly rich in those who have brought home to men an understanding of genuine values in life. After all the centuries of human history the besetting fault of the race is still its failure to see the real meaning of life in terms of happiness. Happiness consists in the satisfaction of human desires. The more desires that remain unsatisfied the less of happiness there is. There are two ways then of striving after human happiness, one by persistent efforts for the satisfaction of desires, which multiply however, just in accordance as they are indulged; the other by pruning desires and so leaving the ratio between the satisfied and unsatisfied wishes of humanity smaller than it would be before. $H = \frac{G}{W}$ human happiness equals what we have got divided by what we want. Dividing the denominator of human wants is much easier than multiplying the numerator of acquisitions.

Two great Italians with an interval of over five hundred years between them, Benedict of Nursia and Francis of Assisi, influenced mankind deeply and enduringly in this second direction. The first was Benedict who in the midst of the turmoil and political disturbance of the sixth

and seventh centuries founded a series of retreats in which men might find peace and an approach to happiness by simplicity of life. He made men understand when that understanding was sadly needed how much happiness depended on the lopping off of desires rather than the attempt to satisfy them. Above all he taught the men of his time when they needed such knowledge very much, the dignity of manual labor and showed that man being body and soul, since only proper exercise of body would keep him healthy, even manual labor had its place in a happy life. Perhaps never has the ideal of a healthy mind in a healthy body been so well cultivated as under the rule of this Italian of the early middle ages.

Benedict is one of the great souls of the world's history whose foundation has lived on after him, for nearly a millenium and a half. The Rule that he made for his order has been often praised as representing a wonderful development of human legislation. The largeness of view that enabled him to see the possibilities of the monastic life also for women and which influenced him to help his sister in the organization of the Benedictine nuns is of itself the best possible evidence of his broad sympathetic humanity. His institute preserved to a great extent for the after time the old classics, because it provided permanent homes for libraries, encouraged book collecting and furnished faithful copyists who multiplied books for all of Europe. But his foundation was as far as possible from being a mere foster mother of book learning, even though by that term is meant mainly the precious ancient classics. During the Middle Ages his great monasteries became centres of industry of all kinds, though particularly of agriculture. But they also provided for food distribution, built docks and quays and even vessels, arranged for the improvement of stock and the diversification of crops, organized forestry and made the wilderness smile as a garden. The peasants who lived on monastery land were proverbially the happiest and it was a common saying "it is well to live under

the crozier" that is as the tenant of a monastery or convent, under the rule of an abbot or abbess.

When President Goodell of the Agricultural College of Massachusetts made his inaugural address at that institution some twenty years ago he recalled attention to the fact that the monasteries of the middle ages had been the first agricultural schools. They not only taught the tenants of the monastery lands how to farm to ever better and better advantage, but they improved the various crops by experiment and consultation with each other, they exchanged seeds and blooded stock, they drained marsh lands and subsoiled mountainous tracts which were so often given them because they were of no use to anyone else, they irrigated arid areas, dyked the sea and made gardens smile where there had been nothing but desert spots or sea swamps before.

England as "the garden of the world" owes more to the Benedictines and to other monastic institutions founded under the inspiration of Benedict's influence than to any other single factor. When one stands above Lincoln Cathedral, itself a monument to monastic architectural genius, and looks out over what he is told is the Fen Country, and sees how it blooms, the visitor is likely to wonder why it is called the Fen Country. A fen is a sea swamp. It was here, however, in the midst of the sea marshes of the earlier centuries that at York and Lincoln and many another place great monastic institutions were built up which drained the salt swamps and in the course of time made this the garden spot of the world. In his book on the Ruined Abbeys of Great Britain, Ralph Adams Cram, our American architect, has called attention to how much the monasteries did, not only for architecture and for the marvelous development of the arts and crafts, but also for the encouragement of trade, for the proper distribution of food stuffs to the people, for import and export, for the training of workmen, for all manner of trades and crafts, for the establishment of fairs and markets and in general for the facilitation of human intercourse in times when such developments were very

WHAT CIVILIZATION OWES TO ITALY

sadly needed. Only for the monasteries at which one could stop for the night or for several days, travel would have been almost impossible throughout Europe and that intercourse which meant so much for the diffusion of culture would have been almost impossible. All of this we owe to Benedict's foundation of a monastery down in Italy with a great living idea in it which was to develop and mean ever so much for subsequent generations.

The Benedictines are still very much alive doing their good work in literally every country in the civilized world and many of the uncivilized regions nearly fifteen hundred years after Benedict's death and it looks as though the influence of this great Italian of the sixth century is never to die unless there shall come some cataclysmic change in our present order of civilization. Some of the members of the order during the past hundred years have been among the most influential scholarly men of our modern time.

After Benedict in time, though perhaps not in the breadth and surely not in the depth of his influence over men of his own and the long after time, is his compatriot and brother founder of a religious order, Francis of Assisi, one of the most influential of the Italians of all ages. We are coming to appreciate this very thoroughly in our generation when Francis has attracted world wide attention more than ever before. Probably the last thought that would have come to him in his life time would be any idea of fame or of his influence living on. He made a discovery for himself as to the true meaning of life and put it into practice in spite of the misunderstandings of many around him and after a time he found that many others were fascinated by his discovery and wanted to share his enjoyment of it. They asked to come and live their lives with him and after a while the women pleaded to be allowed to live such lives also, and the consequence was the beginning of a social movement of great significance which has lasted down to our time and has shaped the lives of more people than almost any other and strange though it may seem is shaping them even



CHRIST (MICHELANGELO)

MEN OF WORLD INFLUENCE

at the present time. Sordid and practical though our age may be it has found time and attention to devote to St. Francis and he has been more written about than almost any other in the last two generations.

Francis was a merchant's son in the little hill town of Assisi, born not long after his father went on a commercial journey to France and hence called Francisco, the Frenchman. His father was rather wealthy, as things went at Assisi and young Francis had a pleasant, lively time, even according to his own confession, sowing some wild oats, probably in a very mild way. In his early twenties he fell ill of a severe disease from which it was thought for a time he could not recover. This sobered him to thoughts of the real meaning of life and gave opportunity for introspection and retrospection. Dean Stanley in our time under similar conditions once said "Life looks very different when viewed from the horizontal," and especially is this likely to be true if one is persuaded that one may never view it from the vertical again. Francis came to the conclusion that life lived for selfish satisfactions or the accumulation of passing material things was a delusion. He realized that men in their quest of happiness strive to satisfy their desires, but as these increase in number in a direct ratio to their satisfaction, happiness grows more distant. He determined to seek happiness by putting off the desire for many things for himself and thinking mainly of others. He took "the Lady Poverty" for a bride and earned his daily bread by simple manual labor, but did not disdain to accept alms when his simple teaching of those around him occupied him. Strange as it may seem to our sophisticated generation the young men of the neighborhood, attracted by his simple idyllic life so full of the contemplation of the beauties of nature as expressed in his wonderful Hymn to the Creatures, and yet so satisfying in its sympathy for others, asked to join him. He received them as companions of his pilgrimage through life and the little company became a group of Franciscans. He preached to the people lessons of brotherly

WHAT CIVILIZATION OWES TO ITALY

love and helpfulness, precepts of forgetfulness of self, and lessened preoccupation with the passing things around them, but when people were not ready to listen he preached to the birds and to the fishes and such was his gentleness of spirit that men came to think of him as almost more than human and surely sharing the divine in human nature more than others. It is not surprising then that he was able to settle the feuds of the neighborhood, to bring people together to give a new view point to his generation, to arouse men from sordid living to what was higher and nobler in them and to make life much happier for a great many people.

Assisi was a quite unimportant town in Italy at this time and this was the Middle Ages. It would seem beyond peradventure that a man who lived his life out in this little hill city, despised money, dressed in the meanest of clothes and accepted alms, who because of his singularity was considered for a time at the beginning of his career at least somewhat in the way we now look upon the harmless wanderer without the conventional sense of getting-on in life, likely to be thought of as a tramp, and to be pitied rather than admired, could scarcely hope to impress himself deeply on future generations, and yet Francis' simple life so close to the heart of things and close to the heart of nature not only drew men and women to him in his own time, but has attracted some of the best of mankind to him ever since, whenever his career was called to their attention. Perhaps there has been more written about Francis and his work than any man who ever lived, except Dante and one or two of the great poets, and Dante prided himself on being a Franciscan. Nor has all this writing been done merely by Italians or even by Franciscans, but all manner of people entirely out of sympathy with Francis' religious views have bowed down before the poem that he made his life. In our day such divergent thinkers as Matthew Arnold, Ernest Renan and Paul Sabatier have been ardent worshippers at the shrine of Francis' poetic genius.

His Franciscans have not only lived but have spread all

MEN OF WORLD INFLUENCE

over the world and are still doing magnificent work. Whenever they have departed far from his spirit of detachment from everything they have failed to some extent at least in their great purpose of making people more Christ-like, which was the supreme idea of Francis' life, and whenever they have been most faithful they have accomplished wonders. Few men have ever lived who had such a wide and far reaching influence as this "little poor man of God" of Assisi, *il poverello di Dio*, as he loved to call himself, so that it is little wonder that whole libraries have been written about him and his work. Poets and painters have paid their tribute to him, sculptors and architects have studied his career with almost infinite patience in order to be able to illustrate it in great works of art, and the tributes of the world's finest intellects have been at his feet in every country in Europe. Whenever men think seriously about the significance of life and especially about the comparative triviality of the passing show around them, Francis is almost sure to become a favorite subject of study with them.

He was scarcely dead before his fame spread far and wide. King Louis of France admired him deeply and paid a personal visit to one of his companions, Brother Giles, the simple hearted, in order to hear more of him. Queen Elizabeth of Hungary, that charming character who attracted all hearts to herself in South Germany, was glad to count herself a member of the Third Order of St. Francis, that is of those of his disciples who, living in the world and in the ordinary relationships of married life, still strive by detachment from the things around them to be as poor in spirit as if they possessed nothing, and to realize that they are only stewards of whatever they may possess for the benefit of others. Great scholars and poets like Dante and Giotto enrolled themselves among the Franciscans of this Third Order in the generation after Francis' death. Meantime the Friars Minor came to occupy commanding places in the universities. Men of such imperishable fame as Bonaventure, Duns Scotus and Roger Bacon represent the scholarship of the Franciscans of the

century after his death. Francis himself had gone to the Holy Land, his Franciscans went as missionaries everywhere. In a generation after Francis' death one of them had travelled in the far East and another of them in the near East, one of them had entered Lhasa, the holy city of Thibet, which was not to be entered again by Europeans until our own time. Always it was the spirit of their father Francis that helped them in their trials and hardships and enabled them to bear everything and accomplish all they could for the benefit of others.

Francis' devotion to the Lady Poverty is the keynote to his life. It would seem as though "that sort of thing" with its medieval mysticism and vague impracticality could have very little appeal to the people of a very practical time like ours, yet more than a score of lives of St. Francis, not counting translations, have been issued in our generation. Most of them have been translated into several languages. Many of them represent real labors of love on the part of their writers, distinct contributions to literature. They have attracted wide attention and there is a striking renewal of interest in St. Francis' life and work. Some of this is due to the fact that he was a great poet. His Hymn to The Creatures was declared by men of such a different temper of mind from his own as Matthew Arnold and Renan to be an epoch-making contribution to literature and one of the greatest of poems. What is memorable, however, is the poem he made out of his life which has been the loving study of poetic souls ever since. His career and his subsequent fame are living illustrations of how when a man tries to forget himself the world will never willingly forget him. Self forgetfulness is so rare and so precious that men cherish it, though they may not understand it, and may prove utterly unsympathetic to it during the life of the individual, they come to recognize its true worth and to set it up for emulation and imitation in the aftertime.

Two men who, following in the footsteps of St. Francis in the Franciscan order, accomplished a great good work by

MEN OF WORLD INFLUENCE

very simple means are those whom we have come to know in the modern time as Bernardino of Siena and Bernardino of Feltre. Bernardino of Siena is one of the most popular of Italian saints, a favorite figure for both painters and sculptors. This is the test of popularity in the best sense of the term, for the painters themselves and their patrons were trying to secure ideals for their pictures. He frequently finds a place in della Robbia groups and a series of pictures of his life was made, because of the exemplary value of his activities, for Ara Coeli in Rome by Pinturicchio. Bernardino deeply influenced the men and women of his time and above all succeeded in making a great many of his generation more thoughtful of others and of the sufferings of the poor, and first suggested the idea afterwards developed by his brother Franciscan, Bernardino of Feltre of institutions for loaning money to the poor in times of need. His sermons were sometimes three hours long, and yet people crowded to them and listened with wrapt attention. How practical his preaching was will be best realized from the fact that his appeals for the appeasement of the bitter, even mortal feuds so common in Italy often moved people to do very wonderful things in overcoming enmities of long years duration, while his sermons on charity aroused all their better natures.

To Blessed Bernardino of Feltre, another of the great Franciscans of the fifteenth century is due the organization of Monti di Pieta — *mons* in Latin meant an accumulation of wealth or money and hence came to refer to a lending institution of any kind — and the *montes pietatis* were charitable lending houses. It is easy to understand how much they meant for the immediate necessities of the poor without any tendency to pauperization of them. Only a genius could have appreciated the many details of the work by which it might be made helpful and organized its administration. Hence Bernardino has been highly honored, and now in our time that the organization of charity has been taken up again, the memory of his deeds and of the inspiration of St. Bernardino of Siena is coming into deserved recognition once

WHAT CIVILIZATION OWES TO ITALY

more. Many times since in many countries these ideas have been fruitful.

Any mention of Franciscans whose work has lived after them almost like that of their great father, Francis, would be incomplete without a reference to Anthony of Padua, one of the early Franciscans. He was the first teacher in theology in the order, but he is more famous as a preacher and as a wonder worker in social life. The effect of his words on those around him was so great that he was able to bring about the correction of all sorts of social evils and to alleviate social abuses. Family feuds that had lasted for generations were appeased under his pleading, the poor were taken care of, injustices were corrected, restitutions made and scandals repaired. Through his influence the municipality of Padua, March 15, 1231, passed a law relieving debtors who could not pay their debts of the necessity of spending their lives in prison. As the result of a brief life, for he was only thirty-six when he died, Anthony had succeeded in bringing about a noteworthy correction of the three most obstinate vices of the time, luxury, avarice and tyranny. A magnificent church in his honor was erected in Padua where his remains are treasured. It is one of the most famous shrines of Christendom and Anthony of Padua is still honored all over the world, and as the result of movements initiated by him social organizations for charitable work of all kinds still exist all over the world, and statues of him are to be found in most of the churches of America at the present day.

Contemporary with St. Francis was an Italian churchman whose life lived at the very opposite pole to that of St. Francis, who had even more influence at the time and whose work has continued to be ever since a notable factor in the social life of Europe. This was Giovanni Lothario Conti whom history knows as Innocent III, Pope from 1198 to 1216. Virchow in a well known passage of his essay on the history of hospitals, has told the story of Pope Innocent's relations to the solution of Europe's social problems during a trying period, in terms that are more emphatic than anything that

anyone else less well informed than he would dare to use. Almost needless to add Virchow, so far from being a papistically minded individual was rather the contrary, so that his tribute carries all the more weight.

“The main factor decisive in influencing the world and arousing the interest of the people of the time in the hospitals of the Holy Ghost was the Papal enthusiasm in the matter. The beginning of their history is connected with the name of that Pope, who made the boldest and farthest-reaching attempt to gather the sum of human interests into the organization of the Catholic Church. The hospitals of the Holy Ghost were one of the many means by which Innocent III thought to bind humanity to the Holy See. And surely it was one of the most effective. Was it not calculated to create the most profound impression, to see how the mighty Pope who humbled emperors and deposed kings, who was the unrelenting adversary of the Albigenses, turned his eyes sympathetically upon the poor and sick, sought the helpless and neglected on the streets, and saved the illegitimate children from death in the waters? There is something conciliating and fascinating in the fact that at the very same time at which the fourth crusade was inaugurated through his influence, the thought of founding a great organization of an essentially humane character, which was eventually to extend throughout all Christendom, was also taking form in his soul; and that in the same year (1204) in which the new Latin Empire was founded in Constantinople, the newly erected hospital of the Holy Spirit, by the old bridge on the other side of the Tiber, was blessed and dedicated as the future centre of this organization.”*

Pope Innocent is probably more misunderstood than most of the popes, but it has ever been the fate of greatness to fail of understanding in the eyes of lesser mortals. He is often cited as an example of the pretensions of the Papacy,

* Virchow's article on the German hospitals is to be found in the second volume of his collection of essays on Public Medicine and the History of Epidemics, which is, unfortunately, not translated into English, so far as I know, but will have to be consulted in the original *Gesammelte Abhandlungen aus dem Gebiet der Oeffentlichen Medicin und der Seuchenlehre* von Rudolph Virchow, Berlin, 1879. August Hirschwald.

but the more one knows of his career and what he succeeded in accomplishing, the less thought is there of any personal ambition of the man or of his pretensions as a ruler, and the more of his great unselfish striving to make life happier for mankind. He compelled the French monarch to take back as his wife Ingeborga, whom he had married from the Scandinavian countries, and whom since he had become enamored of a younger, handsomer woman, he thought he could put away with impunity because she had no powerful friends. He interfered actively in the political troubles in England, protecting King John against the exaggerated claims of his barons and the people from royal and baronial authority, but he thought much more of what Christianity could accomplish for the people than for the aggrandisement of the papacy or his own personal satisfaction. He had noted the suffering of the ailing poor and organized the famous Santo Spirito Hospital at Rome, calling to help him for that purpose Guy of Montpellier, who had made the finest hospital in Europe down there, and then every Bishop who came to Rome for his official visit was enjoined to organize a hospital like it in his diocese. Until the religious revolution of the sixteenth century came to confiscate foundations made for the poor, disturb the religious orders and obliterate the charitable institutions of the preceding time, the influence of Pope Innocent's work continued to be felt all over Europe. It still lives in almost innumerable institutions, for Virchow was able to trace most of the hospitals of Germany back to foundations of hospitals of the Holy Ghost, for which Innocent III is ultimately responsible. What was true in Germany was true also in the other countries in Europe.

As for the man himself his profound little book of spiritual philosophy on the contempt of the world, *De Contemptu Mundi*, which is still often read not only by those interested in spirituality but also by those attracted by the literature of personal philosophy, must be taken as the best revelation of the character of the man. In subsequent centuries because of this well known effort in this mode of letters, that master-

piece of spiritual philosophy *The Imitation of Christ* was attributed to Innocent III by many, though as we now know not on good grounds. To those who knew him personally Innocent was looked up to as one of the gentlest, kindest of men, and the most sympathetic of friends. He is in every way worthy of the great spirits of the thirteenth century, a fitting contemporary or forerunner of men and women like St. Francis, St. Dominic, St. Louis, Albertus Magnus, St. Thomas Aquinas, St. Clare and St. Elizabeth of Hungary, who in the thirteenth century impressed themselves deeply not only upon their own generation, but lived so close to the heart of human nature that serious thinkers in all generations have turned to them in sympathetic reverence and admiration.

Pope Innocent is but one of a series of Italian Popes who exerted a broad influence on the world of their time, and the work of some of them has lived on even to our time. They were among the greatest administrators of the world's history. The Italian Popes include such names as Gregory VII, Hildebrand, born in Tuscany, whose genius for administration has placed him deservedly among the world's greatest men and whose career is a wonderful example of the power of the human spirit to lift itself above obstacles of all kinds, and succeed in accomplishing great results in spite of what would seem to ordinary men insurmountable opposition. The son of a poor man, in his own younger days a swineherd, he succeeded in reforming the abuses that threatened Christianity because of the determined, ever repeated effort of secular rulers to keep the Church in subjection to the civil government. Eventually the German emperor had to submit and come in penitential garb and spirit to Canossa, and Gregory was able to formulate a policy for the Church that has maintained itself and has done more to keep secular abuses out of Christianity than anything that ever was done. He ascended the Papal throne with fear and trembling that he would not be able to accomplish the great reforms that he saw necessary, but he succeeded beyond all expectations. Like all really great men he has been profoundly misunderstood. It is an

index of his greatness, but there is no doubt of the breadth and depth and enduring quality of his influence.

It would be quite impossible in the brief space at our command to give a list of the famous Italian popes who stamped their personality so deeply on their own time that its impress has lasted on all the generations since. Some idea of the place in history of the Popes born in Italy may be given in very brief form by taking even the Popes of the name of Gregory, whose influence is still felt in the after time. The first Pope of the name Gregory the Great, Saint and Doctor of the Church "is certainly one of the most notable figures in ecclesiastical history. He has exercised in many respects a momentous influence on the doctrine, the organization and the discipline of the Catholic Church." (F. H. Dudden, *Gregory the Great*.) He reformed the Roman Liturgy, and had much to do with the introduction of Plain Chant which for that reason is often called Gregorian. He is perhaps even more famous in the aftertime for having sent St. Augustine to England for the conversion of the English. When he became pope the patrimony of the Church had become very large because of gifts and accumulations, and living at a time when widespread disaster from floods, pestilence and famine affected Italy, he emptied the treasury of the Church for those in need.

The next Gregory, 715-731, aroused Christendom to the Moslem danger and resisted the innovations especially with regard to images which the Eastern emperors were trying to introduce into the Church. Pope Gregory VII has been mentioned. Gregory IX was one of the very prominent men of his time and that that very great time, the Thirteenth Century, who came to occupy an important place in the life of one of the world's most significant eras. It was he who raised St. Francis of Assisi, St. Anthony of Padua, St. Dominic and St. Elizabeth of Hungary to the dignity of sainthood, and thus gave a great impetus to social work and education for the poor. Pope Gregory X was another one of the great Popes of the thirteenth century, and he accomplished much in set-

MEN OF WORLD INFLUENCE

ting the factional wars in Italy and in bringing about a union between the Eastern and Western Churches, though for political reasons it did not last long. Pope Gregory XI brought the papacy back from Avignon to Rome. Pope Gregory XIII is famous for securing the correction of the calendar. Pope Gregory XIV has now come to be a prominent figure for us in the United States, because in 1591 he ordered reparation to be made to the Indians of the Phillippines by their conquerors wherever it was possible, and commanded under pain of excommunication that all Indian slaves in the Islands should be set free. Pope Gregory XV reformed the mode of electing to the Papacy, created the permanent congregation of the Propaganda to which was given control of all foreign missions. This is the greatest missionary society in the history of the world, whose work has been so quietly done that it is only now coming to be properly appreciated. Gregory succeeded in arbitrating some extremely difficult political problems in his time and in several instances averted what seemed inevitable wars. Appreciation for his services as arbitrator led to presents of books and manuscripts which greatly enriched the Vatican library.

If mention of distinguished Popes bearing other names, as for instance Leo, of whom there were thirteen, or Pius (ten) or John (twenty-three) or Benedict (fifteen) most of whom were born in Italy, were to be made, a whole volume would be needed, to treat, even cursorily, of their great influence on their generation. At least as large a proportion of them as of the Gregories would be found to have been men of distinction whose personalities impressed themselves for good on their own generation as well as on many of those which followed.

Many of them initiated movements of various kinds or encouraged the extension of them in such a way that these still continue to be of very great service to mankind. Pope Leo I for instance, known as the Great, turned Attila back from devastating Italy, and was a patron of the arts to whom we owe much, and a doctor of the Church, while the last of the

name was Leo XIII of precious memory, and one of the Leos was Pope Leo X whose name is famous in the age of Leo X.

One of the great Italians who belongs to the world almost more than he belongs to Italy itself is Lorenzo de' Medici, whom historians have ventured to call Lorenzo the Magnificent. It is not usually realized that Lorenzo and his family held no formal office in Florence, at least until after the beginning of the sixteenth century, yet they practically ruled the city by their genius for administration and the many friends they made because of their evident good purpose to benefit their fellow citizens. Lorenzo was only twenty when, on the death in 1469 of his father Piero, known as *Pater Patriae* because of his benefactions to his native city, he succeeded to the immense wealth and political power of his family. Lorenzo died when he was scarcely more than forty, and yet he had proved such a magnificent and munificent patron of arts and letters, and such a source of incentive and encouragement for artists and scholars and literary men, that his name will forever be associated with the fame of the men whom he helped to make their careers. Roscoe's great life of Lorenzo The Magnificent, is the historical tribute that made the Western world appreciate him properly. Some of his own writing in prose and poetry shows that he was much more than a mere politician or even a statesman, he was a serious thinker of good taste and scholarship, a poet of no mean rank even among Italian poets, and an appreciative critical connoisseur of beauty in all its modes of expression among men.

His second son, Giovanni de' Medici, who became Pope as Leo X in 1513, worthily carried on the tradition of his family so that the great period of the later Renaissance used to be spoken of as the Age of Leo X. Until a century ago this was considered one of the great epochs in the intellectual and artistic history of the world, an era of achievement in arts and letters worthy to be placed beside the Periclean age at Athens or the Augustan in Rome. Against this exaggeration of favorable estimation there came, as might be expected, a reaction which led to over depreciation. This has

now been yielding to saner criticism during the past generation and we are beginning to recognize the Age of Leo X once more as indeed a very great period of human history, worthy of the study and admiration of the men of every generation in every country. Besides his patronage of arts and letters Pope Leo X did much to solve political problems in Italy by expelling the petty tyrants from the ecclesiastical states and making it possible for Perugia, Sinigaglia, Fermo, Parma and Piacenza to have liberal government.

An Italian who deeply impressed himself on the men of his time and has occupied no little attention in the educated world at least, in the after time even more so than in the past generations, is Jerome Savonarola who was put to death at Florence in May, 1498, at the age of 46. He was a member of the Dominican Order, distinguished for his care for others, his self denial and his piety. His preaching won many new members to the Order and the example of his own life of strict mortification, while he lived in a small, poor cell on simple, scanty food, dressed in coarse clothing, added weight to his words. When he preached in that city of ample churches, no Church was large enough to hold his audiences. His success may be judged from the story of the great reformation in the morals of Florence which has come down to us. Unfortunately political motives, actuated some of his followers and political disturbances in Florence hampered his work. He brought about a great social reform, but political complications caused his condemnation to death. It gave him the prestige of a martyr, however, and heightened and deepened his influence so that there are few men with regard to whom more has been written than this martyred Dominican. His influence did much to prevent the deterioration of Christian ideals, which was taking place under the stress of pagan teachings in connection with the New Learning in his time. One of the greatest of modern Popes is said to have declared that one of the first of the immortals he hoped to greet in heaven was Savonarola and one of the first of earthly mysteries he hoped to have solved

for him was the condemnation of so saintly a character at the hands of ecclesiastics.

Another of the great Italians of influence that was profound in his own time and has lived on so that it promises to be undying is Philip Romolo Neri who is better known as St. Philip Neri. His place in our world of today will perhaps be best appreciated by the average man from the fact that Cardinal Newman loved to call him his "beloved Father Philip" though their lives were 300 years and their environments 1,000 miles apart. Such distinguished English literary men as Father Faber, the poet, Father Bowden, the Dante scholar, and Cardinal Newman's great friend, Father Ryder, were members of the Oratorians, that is the religious order founded by St. Philip. They tried in the later nineteenth century as far as possible to model their lives on that of their loved founder. Like St. Francis of Assisi, he had profound contempt for worldly possessions. When as a young man he was shown his pedigree for he was of noble descent, he tore it up. The burning of his father's house left him unconcerned. After this, he became associated with a cousin in business and applied himself with so much industry and success that his relative wished to give him a partnership and make him his heir. Philip, like our American Thoreau, felt, however, that he did not "have time to make money." He made his way to Rome in absolute poverty, in order to help others. He became a tutor for a time and deeply influenced everyone with whom he came in contact by his quiet, gentle ways, his supreme thoughtfulness for others and his forgetfulness of himself in his readiness to take trouble for the benefit of others.

He occupied some of his leisure in visiting the hospitals and before long there gathered around him a group of young men who shared his self appointed task. He invited a number of them to his room and helped to provide occupation of mind and entertainment for them, apart from the allurements of the city life around them. He became a close friend of St. Ignatius Loyola, founder of the Jesuits, and not



FILIPPINO LIPPI, MADONNA WITH FOUR SAINTS

a few of St. Philip's young friends entered this new order. After a time he gathered round him a group of men who came to be known with the simplicity characteristic of their founder, as the Brotherhood of The Little Oratory. The main purpose of this was to interest young men and boys in the better things of life. His next foundation was the Confraternity of the Most Holy Trinity whose purpose was to care for pilgrims and strangers in the city and for convalescents. Philip simply gave himself up to these works of helpfulness for others and won all hearts by his sincere and kindly ways.

He was thirty-six years of age before he would consent to become a priest, and then devoted all his time to prayer and the care of others. All his morning hours were taken with hearing confessions, receiving the confidences of those in trouble, giving advise and assistance as needed, All his afternoons were spent with young men and boys, interesting himself in their amusements, helping them by his council and above all lifting them up to what was the highest in them. Few men have ever been so deeply loved by those around them as Philip Neri. He came to be known throughout Rome as the dear Father Philip. The Little Brotherhood of The Oratory, so called because their original meeting place was St. Philip's little room called the Oratory, now expanded, and there gathered around him a group of scholars, preachers, organizers of social improvement of all kinds, who accomplished ever so much good. It was of this brotherhood, called the Oratorians, that John Henry Newman became a member some 300 years later and found a congenial sphere for his life work in the Catholic Church. Among the early Oratorians were such men as Baronius, the great Church historian, one of the greatest scholars of the time (see chapter Italian Scholarship), Bozio Tommaso the author of many learned works and others well known to the Italians at least.

Literally dozens of lives of St. Philip Neri have been written and his institute lives on in spite of the vicissitudes of time, suppression under Napoleon, spoliation by the

government, with its work ever successful just in proportion to the imitation of the spirit of dear Father Philip. He came to be known as "the lovable saint" and while his life is full of self denial and prayer, the supremely noteworthy feature of it is his utter devotion to others and forgetfulness of self.

A great friend of Philip Neri's was another of the men whose influence seems destined not to die. At least it has lived on for something more than three centuries and is still a very living force. This was Charles Borromeo the Archbishop of Milan. His Father was Count Borromeo and his mother was Marguerite de Medici. Her younger brother was Giovanni Angelo, Cardinal De'Medici who became Pope in 1559 as Pius IV. After his studies at the University of Pavia, young Charles Borromeo showed that he had good business ability so that though he was the second son, his elder brother entrusted the fortunes of the house to him. His uncle when he became Pope, made him administrator of the Papal States. Here he showed his genius for administration. While occupying this important post and also attending to his family concerns, he was still able to give time to study and to recreations, he could play the lute and the violoncello and even found time and inclination to indulge occasionally in a game of ball. He was, as may be well imagined then, entirely human and eminently sympathetic to every human interest, but he gave himself with great earnestness to whatever represented duty. He succeeded in bringing about a reassembling of the Council of Trent and suggested many of the reforms that were put into effect by the council.

Above all he brought about the organization of religious instruction for both the clergy and the laity. He is recognized by all the world, Protestant as well as Catholic, as the first organizer of what are known as Sunday Schools and a tablet recording that fact is one of the surprises for the visitor to the Essex Unitarian Church, Kensington, London. Charles was made a Papal Legate and succeeded in his jour-

neys over Europe in bringing about reforms in many dioceses and churches. He was very much interested in music and brought about a much needed reform in Church music. He encouraged Palestrina and above all helped to retire from ecclesiastical use the figured music which rather distracted than served to aid in devotion. It had become quite impossible to understand what was said by the singers and conditions were getting worse, so that it looked almost as though music might have to be abandoned as an accessory of religious ceremonies, when Borromeo's influence brought about the reform.

In his own Archdiocese of Milan he introduced many reforms, organized charity, often visited the sick in the hospital himself, corrected abuses and encouraged that thoughtful care of others that meant so much. When the plague, the Black Death, that had so often ravaged Italy and caused such fearful mortality, appeared in Milan, Charles was absent, but he returned to encourage his flock to visit the ailing and above all, to help people to put off the scare that had come over them as a consequence of their dread of the disease. Even many priests and physicians were preparing to flee from the city when Charles' example touched them and his words encouraged them to remain and the consequence was that the city was able to fight the plague to much better advantage.

His position in Europe came to be very remarkable. All the Popes under whom he lived, turned to him for advice and confided the most important offices to him. The sovereigns of Europe, Henry III of France particularly, and Philip II and Mary Queen of Scots, wrote many letters to him and showed how much they valued his influence. Cardinal Baronius, the great Church historian, who knew him personally said that he was a second Ambrose. There are five volumes, octavo, of his works that are still read very faithfully by at least the clergy who are interested in the good of the Church. Catholic Seminaries for the instruction of priests, owe much to his genius for organization in educa-

tion and to the spirit that he infused into that work. It is in this and in the Sunday schools that his influence lives and that his name is mentioned over and over again now more than three centuries after his death.

This volume is full of short sketches of the lives or references to the careers of other Italians whose word will probably never be permitted to die and who in every century have had an abiding influence. Italy's fertility in great men did not stop with the Renaissance. A period of decadence set in during which fewer great men made their appearance, but every century saw the birth of an Italian of world wide influence. After the great discoverers and explorers of the sixteenth century, came the pioneers in modern science of the seventeenth century, and the ground breakers in the biological as well as the physical sciences of the eighteenth and early nineteenth centuries. Down to our own time, Italy has continued to produce men whose personalities were dominant in world affairs.

One of the greatest of Italians in his influence on the world of his time, who changed the course of modern history for a generation at least more than any other, was Napoleon Bonaparte. Ordinarily he is presumed to have been French, but of course his family name was not Bonaparte but Buonaparte. He was born in Corsica of the purest Italian stock. He is often thought of as merely a great military leader with a new formidable tactic by which he cut his ways through the armies of the rather slow-witted generals of his time. His military success enabled him to create an empire for himself on the ruins of the French Republic, which had theorized itself to pieces, and the old monarchies of Europe. He is, however, much more than this, a great administrator, a law maker of profound insight and knowledge of human nature, as the Code Napoleon testifies, a wonderful judge of men, an able writer of French, though it was his adopted tongue, a great organizer in education and a man who in every phase of life deeply impressed himself on the humanity of his time. His career began within

MEN OF WORLD INFLUENCE

a decade after Gibbon had declared that it was quite impossible that anyone should ever again by military prowess create such an empire as Alexander had made for himself or be a military conqueror like Julius Caesar. Napoleon not only rudely overturned these prophecies of a man whose long occupation with history was presumed to have given him a right to an opinion in the matter, but he demonstrated that genius can at any time, even in ours, upset all the calculations of average men and carve out an apparently impossible career for itself in spite of what seem to other men insuperable obstacles.

One of the most influential men of modern times was that distinguished Italian Pope Leo XIII. Few men more deeply influenced their generation. When he became Pope the papacy as the result of the civil disturbances in Italy and practical confinement of the Pope in the Vatican as a prisoner was considered to have lost its prestige to a great extent and indeed there were many quite ready to prophecy that it would never again attain the position of prominence that it had held for so long. Pope Leo lived to abrogate the very prevalent impression that no one would ever live to the years of Peter and at the time of his death was looked up to as one of the profound thinkers on all social and ecclesiastical questions, as one of the world's greatest administrators, as a man whose irenic genius had won the respect and reverence of those not of the household of the faith and who was universally voted as one of the world's greatest men in our time. His choice as arbitrator in the contention between Spain and Germany over the Caroline Islands showed very well the place that he had acquired for the Pope in the modern world.

Some of his formal documents as Pope and especially his encyclicals are enduring monuments in the history of sociology and political science. His Latin poems stamp him as a man of real poetic genius with a marvelous command over the niceties and elegancies of the old Roman tongue. His restoration of Aquinas to the supreme place of honor

WHAT CIVILIZATION OWES TO ITALY

in Catholic colleges and universities is a tribute to his philosophic insight. His handling of all the thorny questions, social and ethical that came up for discussion during his long and troubled pontificate as enshrined in the Papal documents, reveal a man of thoroughly practical intellect and his writings are a monument to the breadth of his genius.

When as an old man of ninety-three he came to die, there were tributes to him from all the great men of his time and there was scarcely an important pulpit in Christendom, even among those who did not acknowledge his spiritual authority that failed to pay a reverend tribute to the saintly old man who for some thirty years had ruled the Christian world and under the most trying conditions succeeded in securing for the Papacy the respect and admiration of mankind. Few men have ever been born at more trying times and yet have not only lived through them and weathered the storms, but have actually demonstrated that storms, instead of hindering, helped their progress.

The claim then that Italy has produced more men of world influence whose personalities live on after their time than any other country can, I think, be taken as proven. At times other countries have produced men who influenced their own times more profoundly, but it is the enduring character of the achievement of the Italians, especially in the moral order as well as in the artistic and intellectual world that has made the debt of civilization to Italy for her great men and women so large.

GREAT WOMEN OF ITALY

TO THOSE who think of women as not allowed a proper chance for intellectual development before our time and above all as refused the opportunity for the higher education and hence deprived almost inevitably of any proper field for the exertion of their influence until now, it must seem as though at least in all that concerns feminine achievement Italy can have no special claims for credit due to it from civilization. As a matter of fact, however, there is no more striking contradiction of the utterly false though extremely prevalent impression that this is the first time that women have ever had the opportunity to develop their intellects than the fact that the story of the Great Women of Italy is an extremely difficult one to compress to the limit necessitated in such a work as this, and that there is bound to be a sense of inadequacy in any treatment of the subject within the narrow bounds necessarily set for a single chapter. Indeed as has ever been the case in history, the women of Italy quite measure up to the men of their country. They made lasting impressions on many generations and the influence of many of them is still a great living force in the world which we are only just beginning to appreciate properly in our time when woman has come into her rights in the Western countries.

It is true that the Italian women have not often shown themselves capable of high intellectual or artistic accomplishment. Nowhere perhaps is it so well illustrated as in the history of Italian accomplishment that woman's sphere is peculiarly ethical and man's intellectual. Noble women have lifted men up to their highest achievement and above

all have helped those who most needed aid and have finely organized the means by which life was made ever so much more happy for almost countless numbers of people who would otherwise have been quite without happiness. The women whose names we know the best in Italy, are those who completely forgetting themselves were deeply thoughtful of others and especially of those who needed most that others should think and care for them. Italian women have above all maintained high ethical standards and under circumstances that often made such maintenance extremely difficult have lifted their generation up to its best humanitarian achievement. Great good women in Italy have been the inspiration of artists, the stimulus for those around them to do the best that was in them, the encouragers of active unselfishness and the finest illustrations of the goodness that lies deep in the heart of humanity.

Indeed it is rather surprising that in the great awakening of interest in everything feminine in our time, the story of the Italian women and their influence is not better known. Certain chapters of this history of feminine accomplishment have been, it is true, faithfully studied in recent years. The story of the women of the Italian Renaissance is now quite familiar at least to all those who have been interested in the woman movement, but comparatively little is heard of the great women of the early Italian universities and of their place in that magnificent development of the higher education for women, which beginning at Salerno, where the department of women's diseases seems to have been in the hands of women, followed this up with similar feminine privileges in every University in Italy during succeeding centuries. As a matter of history, there is not a century since the eleventh during which there have not been women professors at Italian universities and many of them have done epoch making work. Italy's place in feminine education is, however, reserved for a special chapter.

What is above all of interest to our generation is the careers of the great Italian women organizers of the solutions

of social problems. It would be almost incomprehensible that this chapter of feminine achievement has been so little known and indeed so sadly neglected until our own time, only that we have come to realize in our generation that the lowest period of interest in social service occurred during the one hundred years immediately before the middle of the nineteenth century. Only quite recently has Catherine of Siena come to be known and recognized as she deserves to be for her social work. While the revival of interest in St. Francis has led to a corresponding revival of the desire for knowledge with regard to St. Clare there are many women, such as Catherine of Bologna and still another, Catherine of Genoa, Angela Merici and a host of other names of women deserving of mention who, forgetting themselves, accomplished things which though they may have been partially lost sight of or not properly appreciated for a time, the world will never willingly forget. Their memories are still cherished not alone in their own Italian cities as well as everywhere throughout the Catholic Church, which conferred the highest title of honor on them in her attribution of the name of saint to them, but also wherever Italian history is known. Now that interest in the solution of social problems has become the keynote of progress, these great Italian women are at last coming into their own meed of recognition and proper appreciation. Indeed, when the history of the women of Italy is told, even with the compression necessary in a book of this kind, it makes an extremely important chapter in human progress at its best.

In this chapter, as in others, the story of the women of Rome, though they too are natives of the peninsula, and the ancestors of many whom we now call Italians will not be dwelt on more than in passing. They would require a chapter for themselves and that would have to be very much compressed. The old Roman matrons whose fine influence meant so much at Rome could scarcely be adequately treated in an ample volume. Their disappearance and replacement by the wealthy heads of luxurious houses without children, or with but one or two and little regard for their homes, some of them counting

their years by their divorces, as one of their own historians said, living idle lives centred in themselves, or fussy trivial existences absorbed in what we have come to call "society"—which they had invented—brought decadence to Rome in spite of its world power and genius for government. Some of those old-fashioned Roman mothers and wives are among the greatest women of history. Cornelia, whose "jewels" were her sons and who was ready to send one and then the other to death for the sake of the rights of the Roman people, is a striking example of the Roman matron at her best, a worthy successor of the wife and mother of Coriolanus. Julia, the daughter of Caesar and the wife of Pompey, of whom the Romans deservedly thought so much that when she died untimely and Pompey would have built an imperial mausoleum for her on his estate outside of Rome, the citizens said "No! Bury her in the Campus Martius with our heroes," is another striking example. Octavia, who in spite of ill concealed sneers and the scandal she knew was everywhere bruited about, tried to maintain peace between her husband Antony and her brother Augustus, in the midst of the only too well founded rumors of Cleopatra's conquest of him that were common property, was another of the noble Roman women who were also Italians. Quite needless to say there were many others deserving of mention.

In the very early days of Christianity the order of deaconesses was established in Rome and after the persecutions ceased and Christians could do their good works in public, Fabiola founded the first public hospital. While it has come to be the custom in recent years for certain writers to minimize what Christianity accomplished for hospitals, it must not be forgotten that this attitude of mind is assumed by those whose own often recently acquired opposition to religion has tempted them to find any reason for belittling Christian influence. Virchow, who knew the history of hospitals better than any other declared emphatically that it was reserved for the Roman Catholic Church to establish institutions for the care of those suffering from disease. The great German

pathologist and medical editor quotes unquestioningly Herter, who in his life of Pope Innocent III declared:

“All benevolent institutions which the human race still enjoys all care for the deserted and needy through every stage of suffering from the first moment of birth to the return of the material part to earth, have had their origin in the church. Some of them directly, some of them indirectly through the sentiments and feelings which she aroused, strengthened and vivified into action. The church supplied for them the model and sometimes even the resources; that these great humanitarian needs were not neglected and their remedies not lacking in any respect is essentially due to the Christian Church’s influence on human character.”

The achievements of Christian charity thus amply recognized by Virchow following Herter, are practically all due to the initiative and power of organization of Christian women. The first important successful works of charity in this direction were achieved by the women of the Italian peninsula. Some of these women of the early Christian times became famous also for intellectual accomplishment. St. Jerome’s association with Eustochium and Paula is well known. Eustochium spoke Latin and Greek with equal ease and was able to read the Holy Scriptures in the Hebrew text. Many of St. Jerome’s biblical commentaries owe their existence to her influence, as he himself has told, and to her in recognition of all that her influence meant in this regard for him he dedicated his commentaries on the prophets Isaias and Ezekiel. She founded in conjunction with her mother Paula a series of nunneries in Palestine where a large number of women spent their time in prayer and in the study of Holy Scripture. Undoubtedly their presence had much to do with the wide diffusion in a short time of St. Jerome’s Latin translation of the Scriptures, the Vulgate, which is still acknowledged by all as the most important text of the Sacred Writings. When Eustochium died she was succeeded in the superiorship of the nunneries in Palestine by her niece, the younger Paula, whose reputation for scholarship and piety

WHAT CIVILIZATION OWES TO ITALY

and deep intellectual and personal influence over her generation is scarcely less than that of her aunt.

With the spread of Christianity in succeeding centuries and the development of the problem of lifting up into Christian civilization the large numbers from Northern Europe who had migrated into Italy as well as properly elevating these peoples in their Teutonic homes, another kind of feminine influence besides the intellectual was needed. As I have said in the chapter on Feminine Education, when St. Benedict founded The Monks of The West, his sister St. Scholastica founded the Benedictine nuns. These nunneries became homes of the intellectual and spiritual life to which women who felt no call to the ordinary marital existence and its domestic cares might retire with the confidence that they would have a pleasant environment all their lives, an assured refuge in declining years. In every century of the Middle Ages these Benedictine nuns were occupied in work of the highest influence for the peoples around them. Like the Benedictine monks they copied books for their libraries—we have some of the catalogues of them—did beautiful decorations for ecclesiastical books and fine needlework and other decorative arts and crafts for their houses and churches, besides taking an important part in the solution of social problems around them. Volumes of chronicles and histories, of medical writings for the direction of infirmarians, of poems, hymns, prayers, even of dramas, written by these Benedictine nuns have been preserved to us in spite of the vicissitudes of time. They must have had a most intense, intellectual and spiritual life, and they must have accomplished an immense amount of good during these troublous times.

But Italian women could, when occasion offered, be much more than the retiring religious, and some of them demonstrated the possession of administrative ability even in political affairs that places them high in history. One of the great women rulers of history is Matilda of Canossa, Countess of Tuscany. Born before the middle of the eleventh century it might be expected that she would have comparatively little

education, and would owe all her place in history to her native genius. As a matter of fact, she was finely educated, knew Latin well, read much and was very fond of serious books. Her life was cast in troublous times, and she had to exercise administrative ability of a very high order to maintain her position as the heiress of the Marquess Boniface of Tuscany and his successor in the principality. At twenty-five Matilda entered upon the government of one of the most important independent principalities of the time whose territory in middle and upper Italy, during the constant wars of the time, lay directly in the path of the armies of Germany and Italy. She cast in her lot with the Pope against the German Emperor and more than any other single factor, her aid, encouragement and constant fidelity, enabled Pope Gregory VII to accomplish his great work of freeing the Church from secular domination.

In spit of the severest trials Matilda remained faithful to the successive Popes of the time, and her life stood for the great national principle of an Italy for the Italians that makes her a significant figure in history.

“The Great Countess,” as Matilda has been deservedly called in history is almost as noted for her intellectual attainments as for her administrative ability. Mrs. Huddy in “Matilda Countess of Tuscany” gives the list of Matilda’s almost fabulous acquirements. Her tutor and chaplain, Domnizo, himself a poet of no mean distinction whose poems are often quoted as specimens of early Italian, wrote of her as the joy of her race. He said of her for instance, emphasizing first her cheerful kindness to those around her:

“To all she spoke even to the meanest without a murmur;
Gentle, joyful and of a happy frame of mind
She dictated books, she spoke the Teutonic language,
In French also she was very well versed.
None more studious than she and fond of books

Of which she abounded and of all arts and sciences
In the midst of her many labors and in mind happy.”*

Succeeding centuries have paid their tributes to her each in its own way down to our own time. Cimabue painted her as the virgin in martial array. Dante, as commentators agree, so far as commentators ever do, has chosen her name as the symbolic coordinate of Beatrice, the type of action as Beatrice was of philosophy, doubtless with the memory of what Matilda, the Countess, accomplished in his mind. Tasso has paid her high compliment and in the seventeenth century a magnificent monument was erected to her in St. Peter's at Rome with the inscription “a woman worthy of eternal praise.” Mrs. Huddy has emphasized Matilda's goodness of heart and her care for her people and her fine womanly solicitude for the happiness of those around her. To quote her words:

“Matilda lived longest and best in the hearts of her people, more especially the poor, for whose happiness she labored and on whom she spent the greater part of her vast revenues.”

Probably Matilda's greatest work for her own and succeeding generations must be considered to be her encouragement of Irnerius in legal studies and the patronage of his work as a teacher of law. Irnerius' lectures attracted attention and brought about the development of a law school, and then in connection with this law school the university of Bologna came into existence, so that Matilda must be recognized as at least the grand parent of the University of Bologna. It is not surprising that with Matilda's influence meaning so much for the new school Irnerius' daughter, Irneria, when she showed a predilection for law studies was encouraged to take them up, and subsequently became a teacher in the law school founded by her father. At Bologna then, as at Salerno, it was the influence of women themselves that had most to do with the

She probably could not write, though she dictated freely, but it is easier to understand that, since the typewriter came in for many who dictate can not use “the machine” and the mere mechanics of writing was viewed from a similar standpoint at that time.

GREAT WOMEN OF ITALY

obtaining of opportunities for the higher education for their sex.

The later middle ages were to see many women of great broad influence, most of whom did not owe their position to any incidental circumstance of rank or noble birth. Just as St. Scholastica, working beside St. Benedict did so much for the women of her own and subsequent generations, so St. Clare, who at the age of seventeen had been taken with the thought of following the beautiful simple life of St. Francis, accomplished similar good for the women of her time, and her work lives on in its influence even in our time. What a brave fine story is that of this little maid of Assisi! With what calm fortitude she maintained herself against the opposition of her family, conquering them completely in a few years, so that her mother and sister eventually died in the convent with her! How courageously she upheld her institute in spite of ecclesiastics who would not or perhaps could not understand what she saw so clearly, even overcoming the opposition of Cardinals and a Pope who could not be brought to see at first how well she had thought out her rule before formulating it! How manly was the courage with which she repelled the Saracens from the walls of her Convent! When toward the end of her life St. Francis' work was being marred to some degree by the pernicious activities of some of his followers, how staunchly St. Clare guarded it! Even years after her death a precious copy of the original Franciscan rule was found just at a time when it was most needed, in the coffin with her. With all this in mind, it is easy to understand what a wonderful influence this little woman of the Hill Country had over her own and succeeding times. She has shared in the revival of interest in everything relating to St. Francis and her work has received a new glory in the attention paid to the time. Her Poor Clares are in every civilized country on the globe now nearly seven centuries after her death, and seem destined to live as long as this stage of our civilization.

Greater even than Clare in her influence more than 500 years after her death, is the maid of Siena who 100 years later

in the fourteenth century illuminated her generation by her forgetfulness of self and devotion to others. St. Catherine of Siena, Catherine Benincasa, as she was known to her contemporaries, was only a dyer's daughter, the 26th child of her mother, with the very limited opportunities for education and intellectual development that could be afforded in such a crowded family in moderate circumstances. Even in early childhood she became preoccupied with doing good for others. As soon as her family would permit, she was but twelve years of age, she took up seriously the duty of caring for the ailing poor in the hospitals of her native town, paying particular attention to those that had the most loathsome diseases. When they wanted her to marry before she was fifteen, as was the custom of the time, she said that she preferred not to, but would like to work for others. They then gave her a trial of the life of toil by allowing her to do all the work of her home where there must have been no end of labor with so large a family, and she did it so joyfully and whole heartedly and withal so efficiently that they took pity on her and allowed her to devote herself to whatever seemed good to her.

After a time she asked to be allowed to live in the hospital and at the age of fifteen this privilege was accorded to her. Even the work of the hospital did not satisfy the ardent zeal of this young girl to spend herself for others. She visited the ailing in their homes and organized a band of helpers who brought many sufferers to the hospital and who visited and cared for others. She was yet but a young woman scarcely out of her 'teens when she came to be looked up to as the greatest force for good in the city. Siena was sadly ravaged by feuds which led to faction fights on the streets in which serious wounds were inflicted and even fatal quarrels were not infrequent. Catherine took on herself the reconciliation of these quarrels and succeeded beyond all expectations. So great was the reverence for her because of her utter self forgetting devotion to others, and so little did anyone want to hurt the feelings or disappoint the efforts for the common good of this servant of the people, whom all had come

to look upon as a being almost of different clay from those around her, that it would have seemed an act of special malice not to yield to her plea for peace. Once when a criminal was to be beheaded she accompanied him at his urgent request to the scaffold to support him through the dread ordeal and though all her life she had sickened at the sight of blood, she accomplished her task of charity to the end, receiving his head as it fell. No wonder the people of Siena almost worshipped her.

In her early twenties her prestige had grown so that her powers of reconciliation were invoked not only as to differences between individuals and the settlement of family feuds, but also the appeasing of quarrels between cities. She was chosen as the arbitress for peace between Florence and Siena. She came to be the best known individual in this part of Italy. After a time she recognized that many of the sad evils and civil dissensions which were rending the heart of Italy were directly due to the absence of the Popes in Avignon. A central authority in the peninsula commanding respect was needed. She had been asked to make peace between the people of Bologna and the Pope, some of whose ambassadors had been put to death by the Bolognese. During the course of the negotiations she visited not only Rome but Avignon, and succeeded in making the Pope understand the necessity for his return to his former capital, in spite of all the political disturbances that were rife in that city. Finally he consented to return on the condition that she would go with him and remain at Rome, because he felt that only her marvelous influence would suffice to quell the disaffection and disturbances in his capital city.

She submitted to his desire in the matter unwillingly enough, for she detested the publicity it brought, and she would have preferred her home and the hospital at Siena. Unfortunately overborne by labors and the hardships of travel in that rude time, she fell ill and died not long after her arrival in Rome. She was only thirty-two, having run a long

course in a short time. Her body, still incorrupt, is the chief treasure of the great Gothic Church of the Minerva in Rome.

Her monument is the beautiful hospital at Siena rebuilt in her honor and which shows at once the veneration of her townsmen and the height to which hospital organization and construction had reached in that time, when most people would be likely to think that such structures were mean and contemptible. According to her biographers St. Catherine did not learn to read until she was twenty-five, nor to write for several years after that, though in the meantime she had dictated many letters. In spite of this limitation of education, which would seem to preclude all possibility of her ever influencing subsequent generations by her writings, the intellectual remains that we have from her reveal her genius very clearly. Her Italian style, in the pure Tuscan of Siena, is a landmark in the history of the language and any word used by her is called a Catharinian word and finds its place in the Academy dictionary as classic. Her letters in five volumes represent the work of a great simple practical spirit, viewing the problems of life absolutely unselfishly, but with a clear eyed vision of realities that is never deceived.

In recent years Miss Vida Scudder has issued an edition of her letters in English because they represent a real contribution to the thought and literature of humanity. Lives of her have been written in every important language of Europe in our generation and many articles devoted to her. Gardner's life of her gives a very full idea of her influence and its causes.* In his bibliography he mentions nearly one hundred important works about her including editions of her writings, some of them in many volumes, and Catherine must undoubtedly be recognized as one of the great women of all time. She was a member of the third order of St. Dominic and is looked up to as the special patroness of the many thousands of women who all over the world under the Dominican rule are doing great, good work of many kinds. She is even in our time the favorite patroness and the beloved resource

* Saint Catharine of Siena Edmund G. Gardner, New York, Dutton, 1907.

for strength and help in times of trial of the doers of the most varied works of service for humanity. Here in distant America six centuries after her time her name is in benediction in the Dominican colleges for women at Santa Clara, Sinsinawa, Wis., or St. Mary of the Springs, Columbus, Ohio, and Caldwell, N. J., in the houses of the Visiting Sisters of the Sick Poor who accomplish so much good in the crowded tenements of New York City, and in the hospitals of Mother Alphonsa Hawthorne Lathrop's (Nathaniel Hawthorne's favorite daughter Rose) Servants of Relief for Incurable Cancer, who are nursing patients suffering from incurable cancer after physicians have declared it impossible to do anything more for them and only death must be awaited. It is clear then how vividly her influence lives on five centuries after her death, for her life is the special study and her example the emulation of these and thousands of other women throughout the world.

The succession of immortal women in Italy is almost never broken for the last thousand years. Catherine of Siena died 1380. The next immortal was born in 1363. She is Christine de Pisan, who must be credited to Italy, as her last name indicates, though because she wrote in French and lived most of her life in France she is usually thought of as French. She was born in Venice but at the age of five went to Paris with her father, who had been appointed astrologer and secretary to King Charles V. At that time astrology represented, as its name properly indicates, the sciences that we now call astronomy. Even its serious students of that time assumed a knowledge of the influence on the stars on human constitutions, that was accepted also more than two centuries later by such distinguished scientists as Galileo and Kepler. To be an astrologer then was not the charlatan it might be supposed to be from the present day connotation of the word. Christine's father Thomas de Pisan was a scholar, a mathematician, an astronomer and distinguished product of Italy's great schools. At this time all the world was looking to Italy for leadership in the intellectual life. His daughter Christine

married early, probably before fifteen, and yet somehow succeeded in obtaining an excellent education in the ancient languages and literature. When her husband died she was only twenty-five years of age and the death of her father leaving her a widow with three children, in straitened circumstances, she perforce set about making her own living, and her only resource was her pen. In six years between 1397-1403 she wrote according to her own account "fifteen important books without mentioning minor essays which compiled make seventy large copy books."

This is the sort of vocation for women that we are inclined to think of as reserved for our time. Mrs. Olyphant is often supposed to have been a pioneer in the creation of it. What wonder that the young widow who succeeded so well was a champion of her sex and wrote many of her books to rehabilitate the character of women and vindicate their talents against some of the defamations or at least innuendos of the poets. She wrote an elaborate biography of King Charles of France, who had been the protector of her father and her own early patron, but the effort of gratitude to make an ambitious literary work of it led to a display of erudition and a diffuseness of style that are unfortunate. Her poetical works consist mostly of long poems, one "On the Mutations of Fortune" with regard to which doubtless she could draw ready inspiration from her own experience, and another "The Road of Long Study" of which she had also intimate personal experience. A series of books and articles have been written with regard to her in the last twenty-five years and a complete edition of her works is being prepared. She was thoroughly French in education and mode of expression, yet her Italian origin must not be forgotten and none of the French women of the time, though with similar opportunities, and even with the incentive of her example and her success, are found to rival her.

Catherine of Siena filled the latter half of the fourteenth century with her work, Christian de Pisan influenced the first half of the fifteenth, and the latter half of the century was

GREAT WOMEN OF ITALY

the scene of the labors of another great Catherine in Italy, Caterina Fiesco, the daughter of Conte Giacomo Fiesco, who was Viceroy of Naples and Papal Chamberlain during the first half of the fifteenth century. Caterina was born in 1447 and being the third daughter was rather encouraged in the idea which she began to cherish very early of leaving the world and being a religious. The Vice Regal Court of Naples was not particularly noted for its purity of manners or morals, and so her parents sent her when she was fourteen to the care of their cousin, Giorgio Fiesco, Archbishop of Genoa, in order that she might be out of the atmosphere of courtly intrigue.

At Genoa she was seen in Church by a son of the Doge, Giuliano Adorno, one of the handsomest of the young men of the "Proud City" of Genoa where wealth and luxury meant so much. He was known to be rather dissolute in his habits, a gambler, and a sower of wild oats, but of this Catherine knew nothing at first. Caught by her girlish fresh beauty and untarnished innocence he fell desperately in love with her and quite carried her away with his ardor. When the Doge in person came to plead with the Archbishop for her hand the marriage of the young folks was arranged.

In the meantime Caterina learned of the true character of her intended and refused point blank to marry him. She did not fancy taking up as a wife the role of reformer of a rake, though so many young women before and since seem willing to undertake it. Very sensibly she doubted her ability to accomplish the task. Pressure was brought to bear upon her however, for the union of the two houses would do much to simplify the politics of Genoa and her fiancé urged and promised until finally she yielded consent, but instead of being married in the customary crimson velvet robe with lavish ornaments of gold and jewels which every noble Genoese bride wore, she insisted on being married in a black *gonella* with a white *Genoese* lace veil. Her mourning robes were a true portent for her worst apprehensions were soon fulfilled. Giuliano neglected his home and his wife after five years of embittered disenchantment Madonna Caterina

betook herself to the convent of the Ladies of Grace. This was the Genoese refuge for unhappy married women and one of her sisters was already there. The world always needs such refuges, perhaps never more than now, but they are not always so ready at hand as in those days, when Italian social prevision provided them. Caterina proposed to remain in the convent and dedicate her life to the service of suffering and poverty.

It was not long before she came to be known throughout the city as a very angel of devotion to those most in need. Her husband's evil habits led him to sink ever lower and lower until at last Caterina found him in the slums, and then superhumanly took up life with him again and lifted him up to what was better in him. She rescued him completely from his evil habits and their home came to be a refuge for the afflicted. Five peaceful years were thus passed and when her husband died he was, thanks to Catharine's example and help, looked up to as one of the great doers of good of the city. His death only provided for his wife a freer opportunity to extend her works of charity further and she gathered around her a devoted band of women in a nursing order which she founded, who cared for every form of suffering and need. She was elected Prioress of the women's department of the Hospital and organized the charities of Genoa. She found time, however, to do writing that attracted great attention in her own time and that has not lost its significance since. Her book on Purgatory published in 1502 has been translated into every modern language and is to be found in every important Catholic library. Besides she wrote a series of dialogues upon religious questions which have continued to be popular in Italy and are often used as a sort of dramatic interlude in the churches.

After this comes the Renaissance and its influence in affording opportunities for women to secure intellectual development is well known. The typical example of the Ladies of the Italian Renaissance, famous for their own intellectual development and for their influence over the men of the time, is Vittoria Collona. Probably the name of no



PIETA (MICHELANGELO)

woman whose fame was not spread by some movement with which she was connected and who owed her reputation to her personality alone, has ever been more widely known than that of this member of the Italian nobility famous for her beauty, her influence for good, her charming simplicity of life and her power to inspire those around her to the accomplishment of what was best in them.

The group of ladies who lived around her at this time have been the subject of study from many respects in our own time. Their influence extended far beyond their own generation and is now being revived with wonderful results. The place of these educated women, educated in the best sense of the word, as not mere knowers of books, but with finely developed taste and interest in art, literature, architecture, landscape gardening in connection with their homes, beautiful interior decoration and the collection of art objects for their houses, is only coming to be properly recognized by the modern world as our own intellectual development leads to the evolution of similar interests and that imitation which is the sincerest flattery.

It is not surprising to learn of the deep influence of so sterling a character as Vittoria Colonna over Michelangelo. After her husband's death she had been inconsolable and spent much of her time for years in convents, in prayer and the writing of religious poetry. While living at Rome she came in contact with Michelangelo the great architect sculptor and the beauty of her character fascinated him. He is probably the most gifted man who ever lived. He thought that he had found in her a woman so far above him that all he could do was worship her at a distance. She suggested subjects for certain of his great sculptures and he wrote sonnets for her that tell us something of the wondrous adoration, there is no other word to express his feeling and it must be used in its highest possible sense, that he had for her. One of them, because it expresses better than anything that might be said the character of Vittoria and the beauty of her influence as it appealed to the greatest of

sculptors, greatest of decorative painters and architects and one of the greatest poets of all time, is given in a note.*

When Vittoria came to die she asked to be buried in the simple garb of a nun of the convent in which she was living and among the sisters with unmarked grave and without ceremonial. As a result we have now no trace of where her body was laid and her charming character completed its modest influence by this last act of hers. She had been the friend and correspondent of many of the distinguished women scholars of the time, made an interesting interchange of letters with Marguerite of Navarre, the distinguished French writer of the time and with Renée of Anjou, the wife of one of the D'Estes. She was a patron of literature as well as of art, herself a writer of religious poetry that is still in honor, but what has lived on is not her intellectual work but her ethical influence and the inspiration that came from a character like hers. In this, however, she is only a striking example of the women of the Italian Renaissance of whom Burekhardt in his work on the Italian Renaissance has summed up the place in life and the influence, in words that are especially applicable to Vittoria and her acquaintances. "Their distinction consisted in the fact that their beauty, disposition, education, virtue and piety combined to make them harmonious human beings." As Burekhardt is one of the greatest students of this time his opinion may well be accepted as final.

The D'Estes were famous and deservedly so. How few there are who realize, however, that Beatrice D'Este for all her fame was but just entering on her twenties when she

*"When she who was the source of all my sighs
Fled from the world, beyond my straining sight,
Nature, who gave us that unique delight,
Was sunk in shame, and we had weeping eyes.
Yet shall not vauntful Death enjoy the prize,
This sun of suns which then he veiled in night;
For Love hath triumphed, lifting up her light
On earth and 'mid the saints in Paradise.
What though remorseless and impiteous doom
Deemed that the music of her deeds would die,
And that her splendor would be sunk in gloom?
The poet's page exalts her to the sky
With life more living in the lifeless tomb,
And Death translates her soul to reign on high."

died. She and her sister Isabelle were tenderly attached to each other and grew up together in the D'Este palace at Ferrara and surprised everyone by the marvelous facility with which they acquired Latin and some Greek as well as their own Italian. Besides these studies they read all the poetry and literature within their reach in various modern languages, and became excellent musicians learning to accompany their singing on the lute. They even found time to become proficient in design and embroidery. The two girls were betrothed to Francesco son of the Marquis of Mantua and to Lodovico Sforza Regent of Milan. The beautiful tomb of Beatrice in the Certosa near Pavia is a tribute of a husband's love, but an index also of the esteem in which she was held by all who knew her.

That is the most interesting phase of the lives of these women of the Italian Renaissance. All of them almost without exception had tender lovable characters and we have some of the most emphatic expressions as to their personal charm from their contemporaries. Beatrice's death was followed by expressions of sorrow that are deep and heartfelt from all those who had known her. After Isabella's marriage and departure from her old home to live at Mantua, she was so much missed that one courtier writes "even the tricks and jests of the dwarfs and clowns fail to make us laugh." While Isabella was famous for her interests in art and letters and had inherited from her father an absorbing love of travel, there is abundant evidence of her tender care for those who needed it and especially among her own people. When the French invaded Italy and captured Rome in 1527, Isabella in her home in the Colonna Palace on the Quirinal furnished a refuge for a great many of the nobility.

Her friends in the invading army enabled her to do this, but it must have been a most trying time. When she returned to Mantua she found it ravaged by famine and plague, which spread all over Northern Italy. She pledged her jewels of which she had a magnificent collection and did all in her power to help the poor people, though in spite of

all her solicitude and care nearly one third of them fell victims to the pestilence.

The intimate friendship which grew up between Isabella D'Este and Lucretia Borgia is the best possible evidence that the slanders against the lady of that unhappy name are without foundation. To some people it seems that while the Italian ladies of the Renaissance furnished bright examples of successful interest in arts and letters and not a few of them were deeply charitable, they also provided, however, many proofs that the spirit of paganism was rife and that men and women cared not what they did, provided only they accomplished their purpose. Poisonings are supposed to have been common and Lucretia Borgia has been held up as a very paragon of malice and evil. Her most recent biographers have not only defended her, but made it very clear that the accusations against her all come from the enemies of her house. The Borgias were a Spanish family making their way in Italy and nearly every Italian's hand was against them. The scandals told of her represent nothing more than the backstairs gossip of the time, which quite without any justification in history have come to represent the popular historical view with regard to this lady.

There is no doubt that during the last twenty years of her life while at Ferrara, Lucretia Borgia, who at the age of only twenty-one became the wife of the Duke of D'Este, was a woman of deep intellectual quality, of excellent taste, and withal of profoundly charitable disposition. She was a judicious patron of arts and letters, a model wife and mother, and above all a wise and beneficent ruler of her people on many occasions. Over and over again she was left in charge of the government while her husband was absent traveling or on the many military expeditions of the time, and she was famous for her thoughtful care of her subjects. First of all the rulers of this time she lifted the political disabilities of the Jew and she made it ever her first duty to care for the poor and the ailing. When she died untimely at the age of forty, she was followed to the tomb literally by all of the

GREAT WOMEN OF ITALY

people of Ferrara who spoke of her as a Saint because of her goodness and unselfishness. The supposed poisonings with which her name is associated have disappeared before the bar of modern historical research and scientific history.*

To show that the women of Italy were not without interest or successful achievement in education in the centuries after the Renaissance we have a number of examples. Perhaps the most striking is that of Helen Lucretia Cornaro Piscopia. Because of her mastery of seven languages she received the title of *Oraculum Septilingue*. She was distinguished for her knowledge of mathematics, philosophy, and even theology. After a brilliant course of study the degree of Doctor of Philosophy was conferred upon her by the University of Padua, in the presence of many persons eminent in the educational world of the time. She became a Benedictine Oblate, a sort of third order of Benedictines, who are religious without wearing the habit. She continued her intellectual career, being made a member of a number of academies and becoming very well known throughout all the Latin countries at least. A statue of her was placed in the University, and in 1685 the year after her death, the University of Padua caused a medal to be struck in her honor. Her published works (Parma 1688) include academic discourses, translations and devotional treatises.

She was a descendant of the famous Cornaro family best known to visitors to Venice from the Cornaro palace now known as the Loredano, her father was procurator of St. Marks and the members of the family had been prominent in the life of Venice for many years. Though thus highly connected and with so many intellectual interests Helen Cornaro was more famous toward the end of her life for her charity and care for those who were suffering than for anything else. Fresh interest was awakened in her life by the feministic movement of the modern times and lives of her have been published in Rome by the Abbess Pynsent of

* See Proceedings Section on History of Medicine, Eighteenth International Medical Congress.

the English Benedictine nuns (Rome 1896) and by De Santi (Rome 1899) and a series of articles were published with regard to her in the *Civiltà Cattolica* and in the American Catholic Quarterly Review during the last years of the nineteenth century. This daughter of the Doges showed that Venice looked upon as commercial could furnish a striking example of feminine interest in the intellectual life. Her career is paralleled by that of Maria Agnesi which is referred to in the chapter on Feminine Education.

A very distinguished Italian woman scientist and teacher of the eighteenth century was Laura Bassi. Born in Bologna in 1711 at the age of twenty-one she took part in a public disputation on philosophy from which she came off with such distinction as to attract the attention of the whole city as well as the University. A month later she received the doctorate in philosophy from Bologna and then was made professor there. The Senate of Bologna conferred a medal on her and she soon began to attract the attention of the intellectual world of Europe. She was in correspondence with many of the most distinguished men of her time and while she was devoted particularly to physical sciences and mathematics she did not give up her interest in literature and kept up her knowledge of Greek very carefully. She was the mother of twelve children and according to tradition devoted to her domestic duties and closely united in affection with her husband and her children. It seems hard to credit that she was as much at home with the needle and the spindle as she was with her books and the apparatus of her laboratory, but this only confirms the idea that genius has energy to spare even for the ordinary duties of life while accomplishing the extraordinary.

It is not unusual to find in Italy that distinguished men are quite ready to confess how much they owed to women for encouragement and assistance in their work. A typical instance of this is Abbé Spallanzani the distinguished biological scientist who was one of the world leaders in every department of science toward the end of the eighteenth

century. His scientific career began at the University of Bologna under the inspiration of his cousin Laura Bassi, the famous woman professor of natural philosophy and mathematics. The latter part of his life he was greatly assisted by his sister Mariana who in order to help him in his scientific work devoted herself with so much assiduity to his interests that she herself became a distinguished naturalist. Many of those who came to consult her distinguished brother found that his sister could supply them with details of information quite as well and she came to be looked upon as one of the prominent scientific students of this time. Spallanzani himself consulted her always with regard to certain questions and considered her opinion of more worth than his own.

Not long after the death of Laura Bassi two other Italian women reached the distinction of professorships at Bologna. These were Maria dalle Donne for whom a special chair of obstetrics was established and the other Clotilda Tambroni, a professor of Greek of whom a well known Greek professor of her time declared that there were only three persons in Europe who were able to write Greek as well as she could and not a score who were capable of appreciating her scholarship as it deserved. Maria dalle Donne was the daughter of poor peasants living near Bologna, but succeeded in obtaining a thorough education and secured from the University of Bologna *maxima cum laude*, the degree of doctor of philosophy and medicine. Because of her knowledge and thoroughly practical experience she was put in charge of the Bologna School of midwives. Afterwards, as we have noted, a special chair of obstetrics was established for her at the University of Bologna. She held this position with great credit until her death in 1842.

Nor did the women of Italy fail to seek and secure intellectual advantages in the time nearer our own. For instance a number of recent Italian women reached distinction in astronomy. Celsus, the celebrated professor of astronomy at Upsala when he went to be assistant at the

University of Bologna found that the director of the observatory had two sisters Madelina and Teresa who collaborated with him in the *Ephemeris* of Bologna. Another distinguished Italian woman in astronomy was Catarina Scarpellini, the niece of Professor Scarpellini, the restorer of the *Accademia dei Lyncei* and founder of the Capitoline Observatory. She organized the *Stazione Meteorologico Ozonometrico* in Rome and edited its Monthly Bulletin. She was very much interested in shooting stars and prepared the first catalogue of those observed in Italy. In 1872 the Italian government conferred a gold medal on her for her statistical work in science and a statue has been erected to her since her death.

A distinguished woman archaeologist of Italy in the nineteenth century is Donna Ersilia Caetani-Bovatelli the daughter of the famous Dante scholar Duke Michelangelo Caetani-Sermonetta. Coming of a distinguished noble family famous since the thirteenth century for its scholarship and its interest in art and culture, Donna Ersilia early acquired a taste for archaeology until she became an authority in it. Her salon in Rome attracted such distinguished historical students as Gregorovius, Theodor Mommsen and De Rossi. The professors and students in the schools of archaeology of the various nations at Rome often met here to discuss archaeological subjects. As the Dean of the department of archaeology of the *Accademia dei Lyncei* she often presided over important meetings in the academy. She was a frequent contributor to the *Nuova Antologia* and has written a series of books on the ancient monuments of Italy and Greece.

The contrast between the position of women in Italy and in other countries is very well illustrated not only by the history of the past but by some quite recent incidents. Undoubtedly one of the eminent scientists of our time in England was Mrs. Ayrton, the wife of the late Professor W. Ayrton the well-known English investigator in electricity. She did some remarkable work on the electric arc and re-

GREAT WOMEN OF ITALY

ceived the first medal ever awarded to a woman by the Royal Society for her observation on the sand ripples by the sea shore. When some years ago she was formally nominated for fellowship in the Royal Society, however, it was discovered that the society had no legal power to elect a married woman to this distinction. In France Madame Curie has twice received the Nobel Prize (from Sweden) once with her husband for physics and once for herself for chemistry and has been awarded a number of other scientific prizes. When there was question of her being elected to the French Academy, the old prejudice against women asserted itself and though she is undoubtedly the greatest of living French scientists there is no place for her in the French Academy of Sciences. In Italy, however, there has been no distinction of sex in the conferring of degrees, the giving of recognition by professorships or memberships in academies for all the centuries of modern history.

Properly to appreciate the women of Italy one needs only read with attention what the great poets of the country have said of their women. There probably never was a finer bouquet of poetic flowers of women's praise to be gathered in any world literature. Dante has made a woman the central idea of his greatest of epic poems. It was literally a declaration from the greatest seer that mankind has ever had, viewing human life not only here but hereafter, that the "eternal womanly" lifted man up, as well as led him on and did more to bring out what was best in him than anything else in the world. Dante's great poetic successors, however, were scarcely less laudatory of the eternal feminine than the prince of Italian poets himself. Petrarch's beautiful sonnets represent not only a tribute, but they were a model which was followed in the development of modern literature by the nations of Europe in the praise of womanly influence. Tasso, the Renaissance epic poet, has given woman a prominent place in his great poem and is indeed what might be called a feminist. It has been said that if

WHAT CIVILIZATION OWES TO ITALY

one wants to know the opinion that men have had of women one must consult their poets; the Italian poets have indeed been unstinted in their praise and recognition of woman in life and in poetry.

2 2 2 2 2 2 2



BRONZE HORSES, ST. MARK'S, VENICE.

ITALIAN CITIES

THE STORY of culture in mankind is a history of cities. We have made formal history the weaving together of facts with regard to states and nations, but that is because the historians as a rule were seeking the favor of those in political power. In ancient times civilization centers around Memphis and Babylon, Jerusalem and Athens. Human progress, such as it is, is registered in the story of the municipal life of these cities and the doings of their citizens. It might possibly be thought that this limitation of the history of culture would be true only in the older time when there was less of diffusion of cultural ideas, but to think so is to ignore the course of human history in what are called modern times for the centers of interest in the modern history of the humanities are Rome, Florence, Paris, London and other great capitols in so far as they deserve a place in this catalogue of foci of human intellectual achievement. Indeed more of the progress of mankind is intimately concerned with the four cities, Athens, Rome, Florence and Paris, than all the rest of the world put together.

When the history of cities is written those of Italy stand out with a distinction that puts them far ahead of the cities of any other nation of the world. The mere fact that the peninsula contains two of the four cities that are the most famous in history, Rome and Florence, the centres of more human interest than any others, almost even than of Athens, is of itself sufficient to give more than a hint of the genius of the people among whom these cities arose. As a matter of fact there is scarcely a city of any considerable size in Italy that has not some special distinction in the

history of culture and there are literally dozens of them whose names are known far beyond the confines of their own country and who are recognized by the civilized world as representing some fine distinctive phase of the power of human expression. When one looks at such a list apart from Rome and Florence, as Venice, Naples, Bologna, Padua, Genoa, Pisa, Siena, Milan, to say nothing of such less well known towns as Perugia, Assisi, Salerno, Ravenna, Mantua, Ferrara and Ancona it will be readily appreciated how important in the history of mankind is the story of Italian municipalities.

There is scarcely one of these towns which has not some unique distinction to its credit, some important individual phase of development in art or letters, in mode of government, in education, in the story of its great citizens, or the history of the municipality, that is of enduring interest. Usually a number of books have been written about each of them and they are the Mecca for visitors in large numbers, even from distant countries. Indeed visitors from abroad represent an important source of income for all of these towns in the modern time because of the appeal of their art treasures or the interest of their remains of previous stages of culture in mankind. They are like the cathedral towns in England, their artistic relics of long preceding centuries are more valuable to them as money makers than would be a great smoky factory with its slums and smudgy employees in the modern time. More books are written about these Italian cities in our time than ever before. Formal guide books have now given way to monographs of various kinds while scarcely any writer who has visited them fails to record in his subsequent writing the influence that was exerted upon him and not infrequently novels and other books are created around the impression produced by some Italian city. There was a time not so long ago when we affected more or less to despise these smaller Italian towns and tourists confined their visits to the more important centres of population and old time culture. Just in proportion how-

ITALIAN CITIES

ever as we in our generation have refined our taste, broadened our interests, deepened our culture, we have come more and more to visit these smaller towns. Often indeed the opportunity presented to see art objects in the environment for which they were created, rather than crowded together in museums and academies, has proved an invaluable addition to the educational value of such visits.

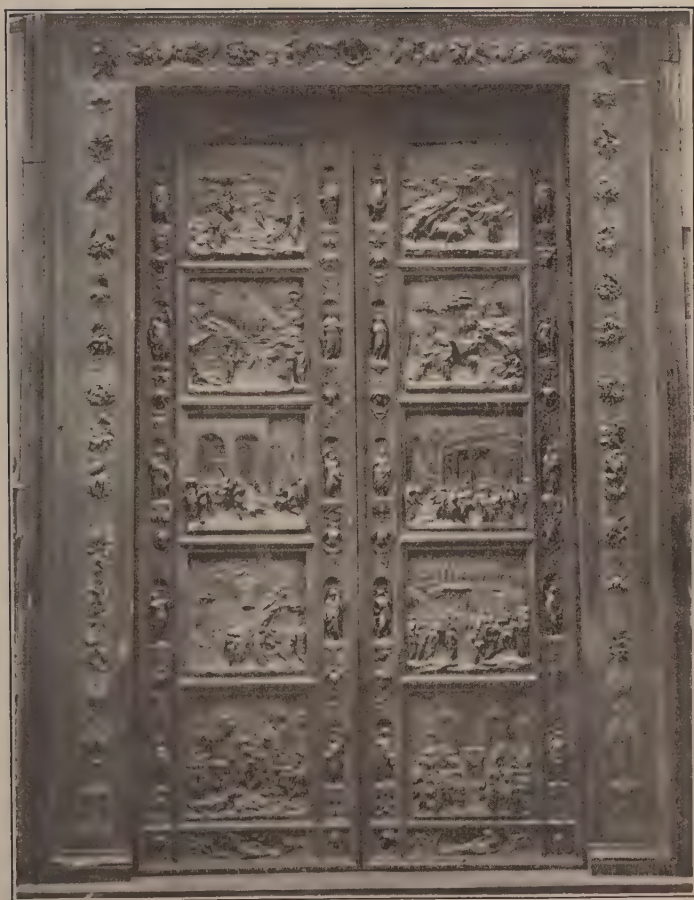
The names of even smaller Italian cities of a few thousand inhabitants have become household words in the families of educated people all over the world. Not to know something of Pisa, of Siena, of Assisi, of Mantua, of Ferrara, towns never of more than a few thousand inhabitants—think of it in this day of the worship of the great city! is to set oneself down as quite unknowing in the real history of the progress of humanity. We in our time speak contemptuously of any city of less than 100,000 and think any place with less than half a million as scarcely worthy of consideration, yet these little Italian towns are forever famous in the history of humanity as centres of attraction for all really educated people. This is much truer now than it was a generation ago and much more noticeable as a criterion of education than it was several generations ago. The Italian cities have grown ever more in favor in proportion as modern judgment has developed and modern taste been properly educated and even while the cult of the great city is ever more in the ascendant.

Of Rome in the older time, that is the classic period, little need be said here. It must not be forgotten, however, that what Rome accomplished constitutes an important part of the debt of civilization to Italy. What is most interesting to realize here is, that while Rome is usually thought of as the source of all initiative and the centre of the intellectual life of this earlier period, most of the men whose names we know because they did distinguished work at Rome were born outside of the city. Their birth places attest the height and breadth and distinction of culture in the smaller towns of the peninsula at this time, though the ordinary student of

history scarcely thinks of them in that way at all. Scarcely one of the men whose names we know as great writers at Rome were born in the city itself. The capital sucked them in, as do the large cities in the modern time the budding geniuses of our smaller towns and then calmly assumed the credit for their work.

The history of these Italian towns furnishes not only great traditions of art development and they present beautiful art treasures, but their story is full of interest because of the lessons in government of the people, by the people, and for the people in all the forms from pure democracy through all phases of republicanism to oligarchy and the various modes of aristocratic government to pure despotism or at least absolute autocracy. There is no richer field for the student of political history than the rise, and progress and vicissitudes and frequent falls of these Italian municipalities. They are interesting mainly because of the depth of human nature which they display, but above all because they thus illustrate almost poignantly the fact that men go on doing things over and over again in about the same way, thinking all the time that they are accomplishing purposes that men scarcely ever dreamt of before, having complacent visions of marvelous progress and yet only repeating old time history and anticipating the modern.

Florence is the most important city in Italy for the foreign visitor who is more interested in modern than in classical accomplishment. It is in this respect the most interesting city in the world. To follow the footsteps of Florence's great men either born there or doing their best work in the city by the Arno, Dante, Giotto, Arnolfo del Cambio, Petrarch, Boccaccio, Donatello, Bruneleschi, Luca della Robbia, Ariosto, Fra Angelico, Fra Bartolommeo, Leonardo da Vinci, Michelangelo, Machiavelli, not to mention the many other names of real distinction that come crowding to the tongue, and to trace the influence of the Medici for good and ill, is the most fascinating chapter in human history. Florence's great art treasures now so admirably displayed



BRONZE DOOR, BAPTISTRY, FLORENCE.

in her museums mean more than anything else. Her churches, in spite of the development of her museums, still retain their attractiveness as in the old time and are among the most interesting ecclesiastical edifices in Europe. Her situation in the valley of the Arno is full of interest and the constant reminder of episodes in her history as one wanders along her streets is the source of more pleasure for the scholarly visitor than he can find in the same compass, anywhere else throughout the world. Even Athens and Rome have not preserved in anything like the same way the memories of their Golden Ages as Florence has. Her Tuscan people are among the most charming in the world and the tourist who comes with the sordid memories of many another European town still fresh has one of the most agreeable experiences of life in Florence.

Florence's political history like that of Venice is a never-ending source of lessons for mankind. During most of her history Florence was as her people thought a pure democracy. They had elections every sixty days in order to be sure that no political clique and above all no political leader should gain control of the city government. They feared a tyrant almost as they would personal injury and yet in spite of all these apparently efficient safeguards the Medici without holding any formal office in Florence practically ruled the city for many generations. From apothecaries dealing in drugs and spices and perfumes and rich tissues from the East they had gradually become bankers and used their wealth with munificent liberality, yet with canny attention to the family political interests. Their position and ambitions made them the political bosses of Florence. They practically dictated the officers that should be elected. It was when their power was highest that Florentine art flourished the most. The great art of Venice and Florence coming under an oligarchy in the one city and under a self appointed autocrat in the other, give rise inevitably to some very interesting reflections on the political

significance of the expression that men are best ruled for their own happiness by a beneficent autocracy.

Bologna's fame is centered much more in education than in art. The only rival in interest of the university of Bologna is that of Paris and there are not many who would not place the Italian institution ahead of its rival. In spite of this academic fame the great reason why the word Bologna is well known is because of the prepared food named after the town, which is still a popular viand. It has sometimes been said that the antipasties of our time came when the women were obtaining opportunities for the higher education and neglecting kitchen duties. There is a bologna pudding, very well known in Italy at least, which together with the sausage might have made a reasonably complete meal and the two are an index of the very practical character of its inhabitants and their inventive genius. Anyone who visits Bologna and sees its great museum of antiquities in connection with the university as well as its botanical garden will know that Bologna deserves the reputation for interest in the things of the mind acquired in the long ago and that that interest has not died out. The Accademia delle Belle Arte has a very precious gallery of paintings chiefly by native artists which furnishes abundant proof of the high artistic talent of Bolognese painters, though none of them were of great genius. Domenichino, Guido Reni, the Caraccis, and Guercino would more than satisfy the ambition of any modern large city to have painters of her own. They came when painting was already decadent in Italy and upheld the tradition the longest. They were esteemed beyond their real value until the last generation and the reaction in favor of earlier art has gone to the other extreme, but these Bolognese painters deserve to have a distinct appeal. Francia and Lorenzo Costa had painted there in the fifteenth century so that the citizens of Bologna manifestly appreciated good art.

The city itself has a place in history for it was founded by an Etruscan king, became a Roman colony under the

name of Bononia, figured largely in the civil wars of the republic, was an imperial residence under the Empire, was able to resist the forces of Alaric, became a free imperial city under Charlemagne, an independent republic with extensive commerce and a powerful army in the tenth century. The Bolognese took an active share in the Crusades, but became involved in the civil wars of the thirteenth and fourteenth centuries, passing from one powerful Italian family to another, Pepoli, Bentivolgi, Visconti, until incorporated with the Papal States at the beginning of the sixteenth century. The town with its arcaded streets is literally full of interest, academic, artistic, historic.

Padua is Bologna's greatest rival in Italy as a university town. In the chapter on education a partial list of some of the students from foreign countries who went to Padua may be found, for it proved to be a Mecca for those in foreign countries who wanted to get a better opportunity for the higher education than they could secure at home. Padua, like Bologna, however, is ever so much more than a university town. Its history is very old and indeed it claims to be the oldest city in north Italy. The original inhabitants were either Paphlagonians or Etruscans. It fought for the Romans against Hannibal at Cannae and the city became so powerful that it was reported able to raise an army of 200,000 fighting men. It suffered severely in the times of the Huns and the Goths and then in the Middle Ages from the internal quarrels in Italy and the tyrants from various powerful families. Probably nowhere better than in the annals of Padua can a good cross-section of the vicissitudinous history of the north Italian peninsula be found.

The presence of the university attracted many distinguished artists. Giotto's paintings in the Arena are now a source of attraction for more artists than almost any other set of paintings in Italy.

Fra Lippo Lippi worked here and many examples of his art may be seen and Donatello's great masterpiece, the magnificent equestrian statue of Erasmo da Narni, known as

the Gattamelata is thought so much of by art lovers that copies of it exist in many of the important museums of the world. Padua's greatest artist is Mantegna of the school of Squarcione, whose "firm and sculpturesque drawing is combined with great beauty of color and genius of expression." To him probably more than to anyone else the early Renaissance in Italy owes the precious discipline of fine example in drawing.

Padua possesses in the church of the beloved San Antonio to whose name that of the city has now become inseparably attached, one of the most fervently visited shrines in Italy. The spirit of St. Anthony and above all his intense devotion to the care of the poor and those in suffering have always affected deeply the social life of Padua and have made it one of the cities where social service in our modern sense of that term has been rather well organized. Many of these old Italian cities have quaint customs of caring for the poor and visiting the sick and burying the dead which made life ever so much more livable for a great many of the poorer classes. Padua had been a leader in this, largely because of devotion to St. Anthony.

Venice has of course a distinctive interest of its own from its situation among the lagoons and its absence of streets with all the annoyances that go with them. There is much more than this however in Venice that has served to attract the cultured people from all over the world. There are few cities indeed which contain so much that is of enduring interest for educated men at all times. St. Mark's itself is a monument in the history of human culture that no one can afford to be ignorant of. In politics the oligarchy that ruled Venice for so long and brought so much of patronage to the city and so much of prosperity at least if not always happiness to the people, while at the same time it encouraged all the arts so well, has been a favorite topic of study for students of political history at all times and never more than our own. An ex-Mayor of New York deemed it worth while even in the twentieth century to make a special

ITALIAN CITIES

study of the history of the Venetian government not merely as an interesting historical document, but because of the valuable lessons for our own time which the history of Venice presents.

These are however, only the least interesting features presented by Venice for most people. Venetian art is one of the marvels of the world. It developed quite naturally out of Venice's artistic glass making. The charming colors of wondrously enduring quality which Venetian artists learned to use with so much success were a precious heritage from the glass-makers. How large and unfillable a gap there would be in the history of art if the names of the Venetian artists the Bellinis, the Vivarinis, Giorgione, Palma Vecchio and Giovane, Carpaccio, Titian and Tintoretto, not to mention many others, were to disappear from it. How strange it seems to us that some of these men were house painters as well as painters on canvass, yet how supremely we have learned to honor them in the modern time. Venice is a wealthy city, yet these men worked for very little money, but for the love of the working and quite as in our own time arrangements had to be made to provide even the small amounts paid to them out of certain public funds more or less surreptitiously. The great John Bellini became the official painter of Venice by holding the office of a city broker and receiving the stipends while someone performed the duties. After much bickering Titian stepped into Bellini the broker's shoes. Venice has its lessons of littlenesses for the after time quite as much as its greatness.

The oligarchy succeeded in making a "city beautiful," supremely so indeed, in many ways, working for the honor of their old noble families and intensely proud of their blood and their exclusiveness and yet they had the good sense not to disdain to accept the old burgher families of the Island of Murano, workmen engaged in glass making, as of noble rank. The names of these craftsmen were written in the great book of the noble families of the republic and their daughters were sought in marriage by Venetian patricians'

sons without a shade of thought of *mesalliance*. Venice has a reputation for cruelty and secrecy in punishment of political offenders that is mainly romance scarcely at all justified by history. Her dungeons, the *piombi* under the leads were not nearly so bad as the damp, dark dungeons of most of the prisons of Europe at the same time. Her "bridge of sighs" has achieved a sentimental fame though perhaps never a condemned criminal crossed it, at most but very few, but there was many another veritable bridge of sighs throughout Europe, though none so beautifully made. Venice encouraged education at Padua, was herself the city of the most famous travelers of Europe from Marco Polo down and some of her dramatists, above all Goldoni, are among the greatest of Italian writers of plays. The amusements provided for the people by the oligarchy kept public entertainments from degenerating to that depth of triviality, when not worse, to which public entertainment has always come to be reduced whenever it becomes a source of profit to the purveyors of it.

Over on the opposite side of the peninsula is Genoa, in Latin Janua, the gateway of the North of Italy. Like Venice it owed its prominence to its trade with distant countries and especially the East, rivaling Venice in this very seriously at many times and going to war with the Queen of the Lagoons over and over again in jealous commercial rivalry. In spite of this similarity of the source of the incomes of the citizens and prestige of the cities, how different is Genoa from Venice, and yet it too is a wonderful city of palaces and its greatest men were seafarers and among its great houses of the famous *Libro d'Oro* were traders who did not disdain however to count among their equals in social station some of the handworker makers of beautiful things in their city. Genoa, the Superb, or the Proud, came to be its favorite title. For Americans it has the distinction of being the birthplace of Columbus, but Americans who stop off for Columbus' sake often stay over for the many interests of other kinds the city has. Genoa is rather famous for her

ITALIAN CITIES

solution of social questions, for the liberal and munificent donations of her citizens to charity and for the devotion of a number of the daughters of famous houses of the city to the work of caring for the ailing poor and needy. The banker finds the history of Genoese banking of supreme interest because very early in modern history Genoa became the banker of Europe and in Michelet's phrase "Genoa was a bank before it was a city." The Bank of St. George founded in 1407 was one of the most ancient and celebrated banks of circulation and deposit in Europe.

Students of architecture find the old palaces of the Genoese nobility well worthy of study in spite of the fact that they were as a rule constructed only of brick covered with stucco. Their architects used these humble materials to wonderful effect. Genoa has always been famous for her harbor improvements and the old pier *Molo Vecchio* is nearly 1,000 years old. The Duke of Galliera by his vast bequests enabled the authorities thoroughly to modernize the port equipment, adding warehouses and every facility for the transfer of goods, so that Genoa might become a great world port. This Italian set a fine example for the wealthy of every land in the cause of the community. The nobility of Genoa have always been famous for their generosity to public service of every kind. Many of their palaces are filled with magnificent collections of artistic treasures and their libraries are well known for the number and great value of their contents especially in manuscript works and codices of various kinds. For long Genoa has had a law forbidding the removal from the city or province of any object of ancient art without the sanction of a commission under the presidency of the Prefect. Genoa has always been famous for her theatre and for the devotion of her citizens to music.

Another of the distinctive North Italian towns is Milan built around its great Cathedral as a centre and containing a number of interesting features which have attracted the attention of tourists of all times. After St. Peter's at Rome and the Cathedral of Seville in Spain the Duomo of Milan

is the largest Church in Europe. Its roof is supported by fifty-two columns with canopied niches for statues instead of capitals and with emplacements for statues everywhere until there are some 2,000 of them in the Cathedral. Even more interesting for the historical student is the Church of San Ambrosio the oldest of Milan's churches founded by St. Ambrose in the fourth century. Bramante's little church of San Satiro and especially its sacristy are among the great master's finest works.

That Milan has still further supreme interests in ecclesiastical architecture is evidenced by the fact, that when the directors of the art museum of South Kensington in London determined to reproduce accurate models on a sufficiently large scale for technical study of portions of the interior decorations of certain notable buildings in Italy, they turned to Milan for the first building to put on exhibition. This was Luini's Chapel of St. Catharine in the Church of San Maurizio, otherwise the Monasterio Majori at Milan. A second example for reproduction was also chosen from Milan, the Chapel of St. Peter Martyr, or as the Italians know it the Portinari Chapel behind the church of Sant' Eustorgio. As less than a dozen models of Italian structures and rooms were made altogether, it is easy to see how much of interest centred in Milan since the originals of two of the models were sought for there.

The city is rich in works of art and the Brera Gallery contains one of the finest collections in Italy, that is to say in Europe. Under Lodovico Sforza, Leonardo da Vinci, Luini, Beltraffio and Bramante the architects were at work there. While famous for interest in art it is almost more worthy of note for its care for the poor and ailing. The great hospital *L'Ospedale Maggiore* is one of the finest in Europe. Some of the best architectural portions of it date from the fifteenth century and one of its beautiful courts was probably designed by Michelangelo himself though Bramante's work has probably also been traced in portions of the structure. Probably the best known of Milan's great

men is St. Charles Borommeo distinguished for his devotion to the ailing poor, to the education of all classes and his personal sacrifices for the care of the needy. The city has always been famous for its attention to the entertainment of its people and the musical taste of the Milanese citizens in general is probably the best in Europe. Their great theatre La Scala, the largest theatre in Europe with the single exception of San Carlo at Naples, is the crucial testing place for Italian opera. To succeed there is to be assured of success elsewhere. Ever since the latter part of the fifteenth century Milan has been famous for its devotion to music. In recent years Milan set the fashion of building great galleries in cities by constructing the Galleria Vittorio Emmanuele, a graceful glass roofed structure nearly 1,000 feet long, some eighty feet wide and nearly 100 feet high, built in 1865-67 and connecting the Cathedral square with that of the theatre of La Scala.

A little town like Assisi is a typical example of how much of interest can centre around a place so small in the number of its inhabitants as apparently to be quite negligible, yet which bulks large in the space it occupies in the mind of humanity. Probably never containing more than a few thousand inhabitants it has been almost as much written about as towns many times its size even in Italy and has attracted more attention from mankind generally than some of the very large cities. We think of it now as the home of St. Francis of Assisi and as some thirty lives of the saint have appeared even in our generation many of them in English, Assisi has become a veritable focus of attraction. It is scarcely less a centre of attention because of the career of St. Clare that marvelous woman friend of St. Francis whose life meant so much for the master's great foundation after his death. It has ever since been a place of pilgrimage even from distant lands for the sake of these two unworldly beings. St. Louis of France went there shortly after Francis' death and many a nobleman has

stopped there since and the place has been a favorite haunt for painters and poets and scholars.

And Assisi deserves all this. Giotto went there shortly after the Saint's death and did some of his wondrous painting in the Church of San Francesco. Cimabue had preceded him. Between them they made the little Hill Town a mecca for artists for all the after time. The Portiuncula made it a great place of pilgrimage for the sake of the indulgences and San Damiano became an attraction for those who were interested in the fact that the simple beautiful life of "the little poor man of God" had opened a career for women as well as for men. Assisi has other attractions however. When Goethe visited the town more than a century ago he did not have any interest in St. Francis and did not even deign to go out to see the great Church of San Francesco. As I have said in the chapter on Painting, the German poet wanted to view the facade of the Temple of Minerva in the Market Place of Assisi which is one of the most beautiful of the remains of the Roman architecture of the Roman empire, so many exquisite examples of which, though none of them perhaps quite so perfect as this facade, may be found in the neighborhood of Perugia, Orvieto and other places in the Hill Country.

Another of Italy's small but very interesting cities not far from Assisi is Perugia. It has the remains of four great stages of civilization. On its site there was an old Etruscan city 700 and more years before Christ. In the time of the Romans as Augusta Perusia it was one of the important Italian cities and was the site of some of the most beautiful Roman art. All down the centuries it maintained its good taste in art. It possesses some beautiful Gothic remains of the thirteenth and fourteenth centuries notably the great marble fountain erected about 1277 by Bevisignate, the brother of Alberto (both Perugians) and Buonsegna (from Venice) and adorned with sculptures by the Pisani. Two centuries later, the Renaissance time, Pietro Vannucci, Perugino, as he is known, did his painting here and had a

group of great students around him among whom was Raphael. Perugino was one of the first great Italian oil painters. His decorations of the Sala del Cambio or Old Exchange of Perugia is one of the most interesting sets of decorations in all the world.

Besides its place in the history of art and in four great periods of human culture (see the chapter on Painting) Perugia has a distinct place in the history not only of Etruria and of Rome but of the Middle Ages and of the modern time. It was recovered from the Goths by Belisarius in 537, it suffered from protracted siege and sack by Totila in 549, it was restored to the Eastern Empire by Narce in 552 and was occupied by the Lombards until the ninth century when through Charlemagne and Louis the Pius it passed under the control of the Popes. On a number of occasions when there were serious political difficulties in Rome the Popes found a personal asylum within its walls and it was the meeting place of the conclaves which elected Pope Honorius II, 1124, Honorius IV, 1285, Celestine V, 1294 and Clement V, 1305. In return for the loyalty of its citizens the Popes fostered education there and the University of Perugia had a reputation in Italy far beyond what the size of the city might seem to demand for it. Pope John XXII issued a well known Bull establishing the medical school of the city of Perugia and requiring the maintenance of the standard of three years of preliminary study at the university four years at medicine and a year of practice with a physician before the license to practice might be given. The Baglioni family ruled for several centuries and though they had no legal position as rulers or magistrates defied all other authority and filled the streets of the city with their broils and butcheries. The Pope succeeded in freeing the people from the tyranny of the Baglioni, but Perugia continued to have a history full of vicissitudes.

Another small town which occupies much more space in human interest than apparently the size of it would seem to demand is Mantua. Here Vittorino da Feltre opened the first

important school of the New Learning and insisted that character must be trained as well as the intellect stored with learning for any true education, that poor scholars must have their opportunities and that the girls who wanted a chance to study must have it as well as the boys. If Mantua had done nothing else but provide an opportunity for this marvelous new growth in all the most important phases of education, it would be a worthy place of pilgrimage for educators. But besides, not far away from it is the birthplace of Virgil, and here are to be seen the beautiful rooms decorated for Isabella D'Este, one at least of which has been copied for the South Kensington Museum, London, and the air is redolent of women of the Renaissance and of the influence that they exerted. Isabella had at her hand Mantegna to select antiques for her. She had Leonardo da Vinci for her consulting architect and decorator and Titian for her portrait painter. She had recognized and appreciated the talent of Correggio, when many of the men around her supposed to be such thorough connoisseurs passed him by unheeding. She entrusted to Perugino the making of the wall panels of her *Grotta*, she sent to Aldus for new editions as he printed them, complaining sometimes that the prices were too high, read the first printed edition of the Decameron and was the patroness of Ariosto and Castiglione. Is it any wonder that the scene of all these triumphs of charming princely patronage and intimate associations of the nobility with the world of art and letters should retain a lasting interest for all those who have a soft place in their hearts for what is cultural in the history of mankind.

One of the extremely interesting cities of Italy, much more rarely visited than most others, partly because its location over on the Adriatic together with the inadequate railway communication have deterred tourists, is Ravenna. Dante students go there because it contains the tomb of the Master poet, students of architecture are attracted by its fine Churches, built from the fourth to the eighth century which represent the beginnings of Byzantine art. Outside they are unattractive, but they are all glorious within. The whole



TOMB OF DANTE, RAVENNA, ITALY

plan of these buildings allows for ample wall spaces, but these are filled up by the wonderful mosaic decorations which "look down upon us as fresh as they did 1300 years back." They were older when Giotto painted his first fresco than Giotto's frescos are now, but they look as a rule almost as if they had been put up last year. How well these early Christians solved the problem of making so absolutely enduring as to be quite permanent their beautiful artistic decorations. We used to think little of them when our own decorative art was undeveloped, but they are growing in estimation with the growth of true artistic appreciation in modern times.

For the student of history Ravenna is interesting because for so long it was the seat of the Western Empire, and Odoacer, when he became supreme ruler of Italy like the Emperors before him, made Ravenna his chief place of residence. Theodoric, the Ostrogoth, laid siege to the place and after three years captured the city, broke the treaty, slew his rival at a banquet in a palace at the laurel grove and reigned here for thirty-three years in the greatest splendor. The city continued to be a centre of authority and of attraction for the rulers of Italy and the East for centuries afterwards. It formed part of Charlemagne's donation to the Pope in the middle of the eighth century. Charlemagne himself carried off the brazen statue of Theodoric and the marble columns of the King's Palace to his own new palace at Aix la Chapelle. There are a dozen of churches that contain memorials of these centuries and Ravenna is thus one of the most interesting cities, full of old time remains and human documents that the world knows.

Almost more interesting than any other of the cities of Italy is Naples, the capital of the rulers of the South. Its neighborhood is intensely interesting both historically and naturally. In the vicinity are Pompei, the tomb of Virgil, Herculaneum and the not distant Capri, while Paestum and other well known tourist features bear evidence of its attractiveness. It was the capital of Magna Graecia in the older times, retained its Greek culture the longest and was the first

WHAT CIVILIZATION OWES TO ITALY

to awaken at the Renaissance. The neighboring University at Salerno was the first institution of the higher education in modern times and for centuries Naples and its vicinity represented all that was highest in culture in Europe.

Its museums are famous, its great theatre of San Carlo was for long the largest in Europe, the dramatic and musical taste of its people made the trying out of literary and musical compositions here one of the tests of merit. The magnificent collections in the *Museo Borbonico* have attracted attention more and more as they are better known. For Etrusco-Grecian relics and Italo-Grecian or pure Greek remains it is unsurpassed and is besides unique as a treasure house of Roman and early Italian antiquities from Herculaneum Pompeii, Puteoli, Paestum, Stabiae and many other places. Such monumental works as the Farnese Bull, the Farnese Hercules, the Dancing Fawn, the Statues of the Balbi deservedly give it almost first rank in the estimation of the sculptors of the world. Naples is famous for its libraries and in recent years for the magnificent biological laboratory at Santa Lucia.

When to all this is added the interest of the vicissitudes of its history, the opportunity to study the intermingling of races Greek, Italian and many others from all over the shores of the Mediterranean, no wonder that Naples has been a favorite subject of study though our knowledge is by no means exhausted. It is undoubtedly one of the most interesting towns in Europe.

Pisa of the Leaning Tower, the Campo Santo and the Cathedral with Galileo's swinging lamp by which all the pendulums of the world were set swinging, where the Pisani did their wonderful work in sculpture and where is the original of the beautiful pulpit which so many of the greatest museums of the world have thought it worth while to have a copy of, has always been an interesting old town. The hunger tower, immortalized by Dante, shows how bitter were the civic feuds of the older time. There have been centuries when the University of Pisa has been the serious rival of Bologna and Padua

ITALIAN CITIES

and the town has always had a magnificent development of the intellectual life. Situated, when we think of our magnificent distances in America, only a few miles away from a number of other Italian towns which deservedly attracted wide attention, Pisa has always had a distinctive individuality of her own that impresses itself upon the traveler and makes him recall her special features as he does not at all the many modern towns ever so much larger and apparently more important through which he has to pass.

Verona would seem to have only the adventitious interest of having been the scene of the tragedy of Romeo and Juliet, but even the casual visitor finds ever so much more to interest him. The great monument to Can Grande della Scala reminds him of this excellent friend of Dante and that in this town many years of Dante's exile were passed and probably more of the Divine Comedy written than anywhere else. It is something to have been the refuge of the poet whose poem is said by many to be the greatest ever written. Verona has a distinction in the material as well as the intellectual order. Probably nowhere did the early Renaissance develop such beautiful building as in this little town. Fra Giocondo (1435-1514) ornamented his native town beautifully and rose to great celebrity as an architect until he was asked to design buildings even in distant France. In the next stage of the Renaissance Sanmichele, who besides being a great architect, was distinguished as a military engineer, designed a large number of magnificent palaces for Verona which reveal at once the taste and the opulence associated with liberality which characterized the great merchants of the little town.

Another one of these little Italian towns forever famous for great work done in it and containing some magnificent examples of that work which still attract architectural students from all over the world is Vicenza. Many of its fine public buildings, of which it has a large number, were designed by Palladio one of the very greatest designers of non-ecclesiastical architecture that the world has known. There

arise in these narrow irregular streets magnificent monuments created by this genius of the later Renaissance which have often been the subject of that sincerest flattery, imitation, in our own day, since we have wakened up to the idea of making our cities beautiful. The Barbarano Palace and the Chiericate have deeply influenced visiting architectural students and while Palladio is not now as enthusiastically worshipped as at one time, there is no doubt at all about his power to build effectively with an exquisite proportion of parts, and as Ferguson suggested "an undefinable eloquence of detail which disarms the critic of Palladio's work." Vicenza had the good taste to appreciate the painters of neighboring Venice and so the city possesses a collection of paintings by the great Venetians that add to the interest of the visitor.

Probably the most interesting feature of the history and culture of all these Italian towns is their eminent individuality. Not only are no two of them alike, but they present the most interesting contrasts in their art and architecture, their modes of government, their popular literature, their amusements, their social life; all these have distinctions that not only differentiate them, but make them intensely fascinating, we may well say by their variety. There is probably no country in the world whose cities present in their history and monuments so many complete contrasts with each other. This is of course what adds greatly to the attraction which Italian cities have for tourists and especially for educated students of human history, who knowing much already find their interest enhanced by all that can be added to their information by intimate contact with these Italian municipalities. Most scholars have favorite cities, or some one mistress of their hearts among these Italian municipalities and find marvelous renewal of pleasure on revisiting scenes that were full of surprise on their first visit.



AMERIGO VESPUCCI

DISCOVERERS AND EXPLORERS

THE FACT that Columbus, best known at least of the great geographical discoverers of modern times, was an Italian is familiar to everyone, but seems to be considered by most people as one of the quite fortuitous accidents of which human history is so full. Certainly there is a very general impression that while the Spaniards and Portuguese are deservedly well known for their magnificent work in exploration and discovery, the Italians, absorbed in their commercial trading in the Mediterranean, accomplished very little. A supreme surprise is in store then, for those who review the names of the most successful discoverers and explorers of the late fifteenth and sixteenth centuries, that time of immense world expansion, and find how many of the most distinguished of them were of Italian birth. They are so numerous and were so much in advance of men from other nations, even from maritime Spain and Portugal that only a brief enumeration of their achievements is needed to make it clear beyond a doubt that civilization's debt to Italy in this field of human accomplishment is scarcely less noteworthy than that in the departments of art and aesthetics.

Columbus is sometimes said to have been cheated of his rights as the original discoverer of this Continent when the Western hemisphere was named America after Amerigo Vespucci, an Italian compatriot who did not cross the Atlantic until five years after Columbus' first voyage. Careful studies in recent years, however, have made it very clear that with all due credit to Columbus for his priority as a daring sailor, Vespucci well deserved that the American

WHAT CIVILIZATION OWES TO ITALY

Continent should be named after him, for he touched the mainland at least a year before Columbus and he furnished the details of accurate information by which maps were made that brought definite knowledge of the American Continent to all European scholars. Waldseemüller's suggestion of the name of America for the New World then, was not a robbing of Columbus of any glory, that should be his — that would have been impossible — but an attribution to a great daring discoverer and explorer of a due reward for his achievements. Vespucci's merits and his thoroughly straightforward honesty, and simplicity with lack of anything like jealous claims for priority for his discoveries are coming to be recognized more and more. When the Numismatic and Archaeological Society of New York resolved to strike a medal each year commemorative of some benefactor of America, it was wisely decided that the first of these medals should be coined in honor of Amerigo Vespucci.

Vespucci visited this country not once but several times. In his very first voyage in 1497 he coasted along the Northern shore of South America the very first to reach the continent, and sailed farther into the Gulf of Mexico. In 1499 he went out with a second fleet and taking his former course entered the mouth of the Orinoco River, and secured some idea of the immensity of the continent from which such a river flowed. He stayed for months, returning to Cadiz in the following year. After an interval of over a year he made a third voyage and reached as far South as 52° latitude, to within four degrees of Cape Horn. Even all this did not satisfy this venturesome navigator and a fourth voyage was undertaken the following year on which Vespucci explored portions of the coast of Brazil. It is easy to understand then that the reports of his discoveries attracted wide attention. He was the first of the great discoverers to secure a place in European literature. In the *Four Elements*, one of the Morality Plays written during the first decade of the sixteenth century, there is a reference to America, but the passage shows that the author had been caught by the account of

DISCOVERERS AND EXPLORERS

Amerigo's (in Latin Americus') discovery of the Continent and not Columbus' voyages. The complete passage is:

“Till now, within this twenty years,
Westward he found new lands,
That we never heard tell of before this
By writing nor other means.
But these new lands found lately
Been called America, because only
Americus did first them find.”

When More in the introduction to *Utopia* wishes to account for his discourse on this wonderful land over the seas, he tells us about meeting Ralph Hythloday, his reference is to the voyages of Amerigo and not to those of Columbus. He tells us that Ralph “was so desirous of seeing the world that he divided his estate among his brothers, ran the same hazzard as Americus Vesputius and bore a share in three of his four voyages that are now published; only he did not return with him in his last but obtained leave of him almost by force that he might be one of those twenty-four who were left at the farthest place at which they touched in their last voyage to New Castile.” It was in his wanderings from this point that he came upon *Utopia* and is supposed to have brought back the information with regard to it which Sir Thomas More by fiction makes use of in picturing his ideal republic. The *Utopia* was first published at Louvain late in 1516 under the editorship of Erasmus and Peter Giles and had probably been finished in 1515, that is within eight years of the first publication of Vespucci's account of his discoveries in 1507.

What Amerigo Vespucci did for South America the Cabots, John and Sebastian, accomplished for North America. The name Cabot has now become so familiar to us here in America particularly, that very few of us recall at all the Italian origin of the family. The man whom we know as John Cabot was really Giovanni Cabotto, a Genoese who after

WHAT CIVILIZATION OWES TO ITALY

fifteen years of residence in Venice took up his citizenship in that city in 1476 and is consequently usually spoken of as a Venetian. He and his son Sebastiano Cabotto established themselves in Bristol in England. Hearing of the voyages to the Indies by sailing westward, made by their distinguished compatriot, Columbus, they set out and reached the Continent of North America and explored the coast for a considerable distance bringing back an account of the lands which they touched and arousing deep interest in England by their discoveries. It was on the strength of their expeditions that England based its claims to the North American portion of the hemisphere. It may be said, however, that it was a long time before Englishmen ventured to make this long difficult voyage which the hardy Venetians had accomplished. The first successful English settlement was not made in this country until more than a century after the venturesome expedition of the Cabots.*

Just as the Cabots, Italians in the service of England made their expedition to North America, so Verazzano another Italian in the service of the French made the first voyage for that country, the one indeed on which France based its claims ultimately to the possession of Canada. Verazzano in 1524 sailing along the coast of what is now the Eastern United States, entered the harbor of New York, sailed up the Hudson River and probably even landed with some of his men on Manhattan Island where a religious service, probably as Rev. Dr. Morgan Dix suggested, the Mass was celebrated. The account of Verazzano's discoveries attracted as much attention in France as those of Columbus in Spain and the Cabots in England. The pioneer navigators for practically all of these Western countries of Europe with the sole exception of Portugal was always an Italian. Their countrymen were not destined to profit much by their discoveries, but that represents all the more reason why their

* Italians found their way to England rather frequently or at least not nearly so rarely as has sometimes been thought, even three and four centuries ago. It is said, for instance, that the direct ancestors of John Bunyan were Italians and the name of the grandfather of the distinguished English writer, is said to be set down in the parish register as Giovanni Bognoni Lombard.

claims to priority of discovery should be given full recognition.

When Magellan, as we know him, sailed round the world for the first time he was of course a Portuguese in the service of Spain. One of his companions on the expedition, however, was Pigafetti, an Italian and it is to him that we are indebted for an account of the expedition. When Magellan sailed on the Pacific for four months without seeing any inhabited land the trials of himself and his companions rose to a climax. Their provisions ran out and they were compelled to eat even the skin and leather where-with their rigging was bound and to drink water which had become putrid. Pigafetti tells how Magellan shed tears of joy when he beheld the immense expanses of the new ocean and found it so calm that he gave it the name it has borne ever since of Pacific. He was destined to find it treacherous beyond measure in its power to feed men on hope and dash their hopes by its unending space. Pigafetti was one of those who stood by him when his crew almost to a man were ready to mutiny against him. In fact it is not quite sure whether his death was due to the natives of the Spice Islands or to his own men who knew his indomitable character once his mind was made up and dreaded his intensity of purpose to circumnavigate the globe, for they were well aware that no dangers or hardships would deter him and they feared the whole expedition might be lost through his obstinate determination to accomplish the aim with which he set out. Pigafetti, after his commander's death brought the expedition successfully through to its end.

Very similar to the case of Magellan was that of La Salle who in 1678 explored the Mississippi from Canada by way of the Illinois down to its mouth. His second in command on this expedition, usually spoken of as Henry de Tonty, was an Italian whose real name was Enrico Tonti. How much the Italian meant for the expedition will probably be best realized from the quotation from Hart's History of the American Nation in which he says: "Even better than

the King's patent was his (La Salle's) acquisition of a lieutenant in Henry de Tonty, a young Italian soldier of fortune, who had served as an officer in the French army but lost his right hand at the battle of Libisso. La Salle found in Tonty a nature as bold and adventurous as his own, and possessing the tact and kindness in which he himself was conspicuously lacking . . . When La Salle, after his expedition in Illinois, returned for naval supplies to Fort Frontenac, he left Tonty at the Peoria Lake entrenched in a palisade which was named Fort Crevecoeur. Tonty, now in charge, occupied Starved Rock, a steep, high cliff on the banks of the Illinois, and built thereon Fort St. Louis. During the spring and summer most of his men deserted—for the employment was not popular, and rival fur-traders were continually trying to seduce Tonty's following; so that, when, in September, the Illinois were attacked by an Iroquois war-party, Tonty and his four remaining companions retreated northward out of harm's way! When La Salle met with his tragic end, Tonty twice went in search of him."

Before this magnificent epoch of discovery which came at the time of the Renaissance and indeed is declared by many to have been one of the great incentives to that marvelous expansion of the human mind which developed at that period, Italy had proved a bold, hardy pioneer in the work of enlarging geographical knowledge and making distant expeditions which brought to Europe not only acquaintanceship with, but a vast amount of detailed information as to even the most distant lands.

The great travelers and geographic discoverers of the Middle Ages were the Venetians. These hardy adventurous inhabitants of the marshy islands of the lagoons along the northwestern shores of the Adriatic, who had withdrawn to this inaccessible location as a retreat from barbarian invasion, succeeded in making themselves a world power by their bold navigation and their venturesome maintenance of communication with distant places. They not only maintained their own independence, but they sent their fleets to distant shores,

made their neighbors their tributaries, controlled the destiny of empires and became themselves a striking example of sea power in history. They formed the centre of trade with the Near East and became the purveyors of Oriental luxuries to Europe to their great profit. They voyaged all over the Mediterranean and came to know every portion particularly of the great inland sea and so it is not surprising that from among them came the great travelers of the Thirteenth Century. The Venetians more than any other people in Europe were familiar with distant countries and Eastern languages and Oriental ways until nothing deterred their enterprise for exploration and commercial development.

One of the greatest of the travelers and geographical discoverers of all time is Marco Polo, the Venetian, who in the Thirteenth Century wandered into Asia, penetrating as far as China, succeeded in finding his way into Thibet and brought back with him even some definite knowledge of the Christian kingdom of Abyssinia. As a matter of fact there was scarcely an interesting country of the East of which Marco Polo did not have something to relate from his personal experiences. He visited such cities in Eastern Turkistan as Kashgar, Yarkand and Khotan which have been the subject of no little curiosity that has been satisfied only in comparatively recent years. He told of Burmah, of Siam, of Cochin China, of Japan, of Java, of Sumatra and of other islands of the great Archipelago, of Ceylon and of India. He had heard and could tell much, though his geographical information was rather vague and legendary, of the coast of Zanzibar, of the vast and distant Madagascar, and in the remotely opposite direction of Siberia, of the shores of the Arctic Ocean and of the curious customs of the inhabitants of these distant countries.

After Venice the most important of the great commercial cities of Italy was Genoa, which became the rival of its Adriatic predecessor. The Genoese too wandered to the distant cities of the East, so much farther comparatively than any commercial voyages now, and succeeded in making their city

WHAT CIVILIZATION OWES TO ITALY

one of the great world centres of commerce and communication. The daring enterprise of its navigators is thoroughly exemplified by what Christopher Columbus accomplished, but many another adventurous spirit whose name has not Columbus' fame went out from this north Italian city which vindicated for itself the name, Genoa the Superb. With the possible exception of Venice, there is no town in history which accomplished so much for bringing the outlying portions of the world nearer to each other and into direct communication for commercial and civilizing intercourse than Genoa.

These great explorers often found on their return home that their stories, instead of being readily accepted and they themselves welcomed and honored as extenders of human knowledge, both they and their stories were often scouted as if they had invented the tales of what they had discovered. Indeed it is very probable that the contemptuous note which has come to be associated with the phrase "travellers' tales" came into existence at this time. They were all thought to be drawing the long bow, especially at the beginning when there was no one to confirm their stories.

Marco Polo, for instance, shares the fate of Herodotus in having the information which he was at so much pains to collect distrusted and even scoffed at as imaginative. Just inasmuch as our geographical knowledge has grown in definiteness and detail Marco Polo has been vindicated. In his *Lives of Celebrated Travellers*, James Augustus St. John, states the change of mind that has taken place with regard to Marco Polo and makes clear the significant position he has come to occupy in the modern world.

"When the travels of Marco Polo first appeared, they were generally regarded as fiction; and this absurd belief had so far gained ground, that when he lay upon his death-bed, his friends and nearest relatives, coming to take their eternal adieu, conjured him as he valued the salvation of his soul to retract whatever he had advanced in his book, or at least many such passages as every person looked upon as untrue; but the traveler, whose conscience was untouched upon that score,

DISCOVERERS AND EXPLORERS

declared solemnly, in that awful moment, that far from being guilty of exaggeration, he had not described one half of the wonderful things which he had beheld. Such was the reception which the discoveries of this extraordinary man experienced when first promulgated. By degrees, however, as enterprise lifted more and more the veil from Central and Eastern Asia the relations of our traveler rose in the estimation of geographers; and now that the world — though containing many unknown tracts — has been more successfully explored, we begin to perceive that Marco Polo like Herodotus, was a man of the most rigid veracity, whose testimony, presumptuous ignorance alone can call in question."

Marco Polo was not the only Italian who traveled extensively in the East at this time. After the Venetian undoubtedly the most enterprising explorer and geographical discoverer was John of Carpini, the author of a wonderful series of descriptions of the marvelous things that he had seen in Northern Asia. John was a Franciscan friar, one of the early companions and disciples of St. Francis of Assisi, whom he joined when he was but a very young man. He rose to be one of the most prominent men in the Order, going on distant organizing expeditions for the propagation of the Franciscans among the Northern nations of Europe and had become familiar with many races and peoples and many tongues, having held positions of authority in Saxony, in Northern Germany, in Spain and even on the Barbary Coast. It is scarcely surprising then that when in 1245 Pope Innocent IV, disturbed by the Mongol invasion of Eastern Europe which threatened European civilization and Christianity, resolved to send a mission to the Tartar monarch, John of Carpini was selected for the dangerous and important task. Though Friar John was more than sixty years of age he accepted the mission with alacrity.

The first stage of his journey took him as far as Kiev in Russia and from here having crossed the Dnieper and the Don to the Volga he traveled down that river to the camp of Batu, at this time the senior living member of Jenghis Khan's

family. After an exchange of presents Batu allowed the friar and his companions to proceed to the Court of the Supreme Khan in Mongolia. Colonel Sir Henry Yule, himself a great traveler and an important authority on the literature of exploration and geography, tells how the stout hearted old man rode on horseback something like 3,000 miles in the next hundred days. I have told some of the story in my book on *The Thirteenth Greatest of Centuries*. The bodies of himself and companion had to be tightly bandaged to enable them to stand the excessive fatigue of this enormous ride, which led them across the Ural Mountains and River past the northern part of the Caspian, across the Jaxartes, whose name they could not find out, along the Dzungarian Lakes till they reached the imperial camp, called the Yellow Pavilion, near the Orkhon River. There had been an interregnum in the empire which was terminated by a formal election while the friars were at the Yellow Pavilion, where they had the opportunity to see between three and four thousand envoys and deputies from all parts of Asia and Eastern Europe, who brought with them tributes and presents for the ruler to be elected.

It was not until three months after this, in November, that the Emperor dismissed them with a letter to the Pope written in Latin, Arabic, and Mongolian, but containing only a brief imperious assertion that the Khan of the Tartars was the scourge of God for Christianity, and that he must fulfill his mission. Then sad at heart, the ambassadors began their homeward journey in the midst of the winter. Their sufferings can be better imagined than described, but Friar John who does not dwell on them much tells enough of them to make their realization comparatively easy. They reached Kiev seven months later, in June, and were welcomed there by the Slavonic Christians as though arisen from the dead. From thence they continued their journey to Lyons, where they delivered the Khan's letter to the Pope, who was in attendance at the Council there.

Friar John embodied the information that he had ob-

DISCOVERERS AND EXPLORERS

tained in this journey in a book called *Liber Tartarorum* (The Book of the Tartars or according to another manuscript, History of the Mongols whom we call Tartars.) Col Yule notes that like most of the other medieval monks' itineraries, Friar John's book shows an entire absence of that characteristic traveler's egotism with which we have become abundantly familiar in more recent years and contains very little personal narrative. We know that John was a stout man and this, in addition to his age when he went on the mission, can not but make us realize the thoroughly unselfish spirit with which he followed the call of duty, to undertake a work that seemed sure to prove fatal and that would inevitably bring in its train suffering of the severest kind. A good idea of the critical historical value of his work can be obtained from the fact that half a century ago an educated Mongol, Galsang Gombeyev, in the *Historical and Philological Bulletin* of the Imperial Academy of St. Petersburg, reviewed the book and bore testimony to the great accuracy of its statements, to the care with which its details had been verified, and the evident personal character of all its observations.

Friar John's book attracted the attention of compilers of information with regard to distant countries very soon after it was issued, and an abridgement of it is to be found in the *Encyclopedia of Vincent of Beauvais*, which was written shortly after the middle of the thirteenth century. At the end of the sixteenth century Hakluyt published portions of the original work, as did Borgeron at the beginning of the seventeenth century. The Geographical Society of Paris published a fine edition of the work about the middle of the nineteenth century, and at the same time a brief narrative taken down from the lips of John's companion, Friar Benedict, the Pole, which is somewhat more personal in its character and fully substantiates all that Friar John had written.

Another famous Franciscan friar traveler was Odoric of Pordenone, who after having travelled over most of Asia dictated an account of his travels, and notes were made of his descriptions of various places and published. As might well

be expected this mode of publication was too loose to assure reliability and so Odoric is credited with many fabulous stories. His work was plagiarized to a great extent by Sir John Mandeville and this still further discredited portions of it. For a time it was doubtful whether Odoric had really visited all the places that he is said to have reached, but Sir Henry Yule has completely vindicated him, and even a brief account of his travels shows what a daring explorer he was. He anticipated the travels of many men who even in the last few years have secured fame by writing descriptions of their sojourns in certain Asiatic countries, for Odoric was at Nanking, in Malabar, in Calcutta proceeding thence apparently to Ceylon and to the Shrine of St. Thomas at Mailapur near Madras, as well as through Persia, Southern Russia and Tartary.

Even more interesting than his travels in India, however, are those in China. He sailed from the Hindustan Peninsula in a Chinese junk to Sumatra, visiting various ports on the northern coast of that island and telling something about the inhabitants and the customs of the country. According to Sir Henry Yule he then visited Java and it would seem also the coast of Borneo, finally reaching Canton, at that time known to Western Asiatics as Chin Kalan or Great China. From there he went to the great ports of Fuhkeen and Schwan Chow, where he found two houses of his order, then he proceeded to Fuchau from which place he struck across the mountains into Chekaeng and then visited Hang Chow at that time renowned under the name of Cansay. Modern authorities in exploration have suggested that this might be King Sae, the Chinese name for Royal Residence, which was then one of the greatest cities of the world. Thence Odoric passed northward by Nanking, and, crossing the great Kiang, embarked on the Grand Canal and traveled to Cambaluc or Peking, where he remained for three years and where it is thought that he was attached to one of the churches founded by Archbishop

John of Montecorvino, who was at this time in extreme old age.

The most surprising part of Odoric's travels were still to come. When the fever for traveling came upon him again he turned almost directly westward to the Great Wall of China and through Shenshua. From here the adventurous traveler (we are still practically quoting Sir Henry Yule) entered Thibet and appears to have visted Lhasa. Considering how much of interest has been aroused by recent attempts to enter Lhasa and the surprising adventures that men have gone through in the effort, the success of this medieval monk in such an expedition would seem incredible, if it were not substantiated by documents that place the matter beyond all doubt even in the minds of the most distinguished modern authorities in geography and exploration. How Odoric returned home is not definitely known, though certain fragmentatory notices seem to indicate that he passed through Khorasan and probably Tabriz to Europe.

Sir Henry Yule summed up his opinion of Odoric in the following striking passage which bears forcible testimony also to the healthy curiosity of the times with regard to all their original sources of information which were recognized as valuable because first hand:

"The numerous MSS. of Odoric's narrative that have come down to our time (upwards of forty are known) chiefly from the fourteenth century, show how speedily and widely it acquired popularity. It does not deserve the charge of general mendacity brought up against it by some, though the language of other writers who have spoken of the traveler as a man of learning is still more injudicious. Like most of the medieval travelers, he is indiscriminating in accepting strange tales; but while some of these are the habitual stories of the age, many particulars which he recited attest the genuine character of the narrative, and some of those which Tiraboschi and others have condemned as mendacious interpolations are the very seals of truth."

WHAT CIVILIZATION OWES TO ITALY

Another of the distinguished travelers in the thirteenth century was the Archbishop John of Montecorvino who because of the wonderful power of organization and administration displayed during his earlier careers as a missionary had been made Archbishop of Kambaluc or Pekin. The story of this grand old man of the early Franciscan Missions is another one of the Romances of Italian travel and exploration though he himself was apparently ever too busy in doing to be able to take the time to write any lengthy account of his experiences. But for the casual mention of him by others the records of his deeds would be found only in the dry summary of the ecclesiastical records of his time and his work would now be known to the Master alone for whom it was so unselfishly done. John was born at Montecorvino in 1246. He had been a Missionary in the near East for many years when in 1286 a request was forwarded to Rome to send Catholic Missionaries to the Court of the great Chinese Emperor Kublai Khan who was said to be well disposed toward Christianity. Pope Nicholas IV entrusted this important mission to farther China to John of Montecorvino because of his long years of experience as a traveler in the East.

Friar John went through Persia and thence by sea to India and then traveled again by sea from Meliapur to China. It was three years, however, before his voyage was completed because he had taken advantage of the opportunity to do missionary work on the way and almost needless to say travel was not easy. When he reached China in 1294, Kublai Khan had just died and Timurleng often known in English as Tamurlane had succeeded to the throne. Timurleng was not ready to embrace Christianity as his predecessor is said to have been, but he gave full opportunity to the missionaries. In 1299 he built a Church at Pekin and in 1305 a second opposite the Imperial Palace and opened a series of schools for instruction in Latin and Greek and in the arts and crafts. In 1307 Pope Clement V, highly pleased with the missionary's wonderful work and the deep im-

DISCOVERERS AND EXPLORERS

pression that he had produced on the Chinese people, sent a deputation to Peking to consecrate John as the Chief Archbishop of these countries. He was to have seven suffragan Bishops who were to be disposed among the important centres of population that John deemed worthy of this distinction.

The Italians of these early times were not only adventurous travellers on land, but also by sea. About the time that Marco Polo and the missionaries were wandering over Asia and bringing back accounts of their travels that modern geographic authorities have come to recognize as representing a very careful observation, other Italians were sailing westward even beyond the pillars of Hercules, adding to the geographic knowledge of mankind in the Atlantic Ocean. In 1270 Lancelotto Mellocello re-discovered what the ancients used to call the Fortunate Isles, that is what we know as the Canaries. Some twelve years later in 1291 two Genoese Tedisio Doria and Ugolino Vivaldi, with two galleys sailed out through the Straits of Gibraltar and turned southward with the intention of reaching India, but unfortunately were never heard of again. Their venture shows that men were thinking already of the way to India and were ready, at least the Italians were, to take great risks to find it. It was an Italian, Antonio de Noli, who discovered the Cape Verde Islands and it is of course to them that men owe the description of many parts of the Mediterranean hitherto unknown or that had been forgotten since the time of the ancients.

After the earlier renaissance with its fine harvest of discoveries in Asia and the Mediterranean as well as the near Atlantic and the Age of Discoverers as Columbus Century has been well called, which added so much to our knowledge of the rest of the world, Italians continued in every century to be pioneers in the great work of making distant countries known and still better known to Europe. In the seventeenth century came Pietro della Valle to whom we owe one of the best books of Eastern travel. The idea of travel in the East

is said to have come to him after a disappointment in love as an alternative to suicide. It might possibly be expected that under these circumstances the story of his travels would be of very little serious value to humanity, yet it has continued to be printed in new editions in succeeding centuries and has appeared in translations in most of the modern languages. The first part of his letters describe his travels in Turkey, the next two parts his travels in Persia and the fourth part in India. His travels began with a pilgrimage to the Holy Land in accomplishment of a vow, but sailing from Venice he stopped at Constantinople for a year and acquired a good knowledge of Turkish and some Arabic and then went to Alexandria and Cairo and thence to Jerusalem. He afterwards visited Damascus and Bagdad and in spite of the fact that there was a war between Persia and Turkey he stole out of Bagdad on a visit to Persia, proceeded by Hamadan to Ispahan and was with Shah Abbas in his campaign in Northern Persia in the summer of 1618.

In spite of his close relations with the Persians and occupation with various political schemes to help Persia by European alliances, he continued his Oriental studies with ardor and wrote out his observations on the people and the country. He was some three years in Persia and then spent nearly two years in India. He returned by way of Aleppo, made a visit to Antioch, touched at Cyprus and Malta and reached Rome. For the next twenty-five years he was looked upon in the literary and scientific circles of Rome where he was enthusiastically welcomed, as the authority on Oriental subjects. The account of his travels though it lacks literary quality and he himself seems to have been totally devoid of humor, is still often referred to because the author was so clear and exact in his details and well informed on all subjects about which he wrote.

James Augustus St. John in *The Lives of Celebrated Travelers* declares that "as a traveler Della Valle possessed very distinguished qualities. He was enthusiastic, romantic, enterprising. He had read if not studied the histories of

DISCOVERERS AND EXPLORERS

the various countries through which he afterward traveled; and there were few dangers which he was not ready cheerfully to encounter for the gratification of his curiosity. Gibbon complains of his insupportable vanity and prolixity, With his vanity I should never quarrel as it only tends to render him the more agreeable. Nevertheless it is impossible to peruse his works without great instruction and delight; for his active and vigorous and observant mind continually gives birth to sagacious and profound remarks; and his adventures, though undoubtedly true are full of interest and the spirit of romance." He is very like the successful writer of travels at all times and the prototype of many of the travelers who have gained prestige in our own day. He anticipated them by centuries and his priority will doubtless keep him the classic that he has been, when our modern books of travel though so widely read in their own day have been relegated to oblivion.

The man to whom the modern world owes its introduction to Egyptian exploration, one of the most enterprising and successful Egyptian explorers, was another Italian Giovanni Battista Belzoni who made his living for some years after having been driven from Rome by the French occupation of that city, as a wandering gymnast, exhibiting feats of agility and strength on the streets. Seeking curiosities to exhibit he went down to Egypt and took up the excavation of the old-time wonders of Egyptian civilization. It was he who shipped to England the colossal statuesque head commonly called young Memnon which he removed with great skill from Thebes. He investigated the great temple of Edfoo, discovered the temple of Abusimbel, made excavations at Karnak, visited Assouan, Elephantina and Philae and went far up the Nile. He was the first to penetrate into the second great pyramid of Ghizeh. He returned to England to publish a most stimulating account of his travels and discoveries and to exhibit Egyptian curiosities and models of some of the Egyptian tombs. His *Wanderlust* would not permit him to remain long settled however, and

be planned another expedition to Africa with Timbuctoo as his objective, but unfortunately died on the way.

Belzoni's account of his travels and his vivid descriptions of the magnificent monuments that he had seen in Egypt awakened interest very widely. "It is absolutely impossible" he said, describing his first impression of Thebes, "to imagine the scene displayed without seeing it. The most sublime ideas that can be formed from the most magnificent specimens of our present architecture would give a very incorrect picture of these ruins; for such is the difference, not only in magnitude, but in form, proportion and construction that even the pencil can convey but faint idea of the whole. It appeared to me like entering a city of giants who after a long conflict were all destroyed, leaving the ruins of their various temples as the only proof of their existence." It need only be added that his explorations were successfully conducted in spite of grave danger from the unsettled political state of the country as well as the jealousies of rivals and the most serious risks from contagious diseases, for even the plague was raging when he first landed. There was besides the unknown dangers of penetrating these old tombs, dark, dismal, with a strong effluvia of decomposed bodies and the dust of decayed mummies so fine that it penetrates the lungs and soon causes difficulty of respiration. Nothing deterred him. He had the true spirit of the born explorer.

In our own time the Italians have not been without world distinction as pioneers in travel and exploration. The Duke of the Abruzzi led a North Pole exploring party a few years ago which for a time held the record of the "farthest north." A few years later the same brave enterprising traveler went down into South Africa and climbed some of the higher mountains of the country, adding greatly to our positive information with regard to central Africa. His accounts of his travels near the Pole and at the Equator were translated into most of the modern languages and deservedly attracted the attention of travelers, explorers,

and writers on these subjects all over the world as well as of the readers who delight in real adventure and who found in the young Italian scion of royalty a character they could admire and appreciate for he could write as well as he could do.

Another Italian who in our time has done much for the increase of information with regard to subjects and places hitherto little known is the Prince of Monaco. He has used the large income of his princely house for studies of life in the Mediterranean and in recent years has been engaged in Oceanographic studies in many parts of the world. While Monaco is sometimes thought of as French from its position on the coast of the French Mediterranean, the Prince is himself a member of the distinguished old Italian family of Grimaldi which has always remained intensely Italian in its spirit and temperament. Few men of the present time have done so much for studies of life in the sea and ocean as this Italian prince, who might after the frequent custom of such men have taken up a life of idleness and ease or occupied himself with some merely trivial perhaps thoroughly unsocial devotion to pleasure as a means of passing time. It is something to make one think of other possibilities as to how the income derived from the gaming tables at Monte Carlo might be spent, to reflect how well the head of the house of the Grimaldi has turned it to the account of the accumulation of human knowledge in some of its least developed aspects.

In the history of nearly 1000 years Italians have been the leaders in geographic discovery and exploration. Their peninsular position with the great majority of the people living near the seashore has made them familiar with and contemptuous of the dangers of the sea which deterred others from undertaking distant voyages. But besides this the heart of the people has been attuned to high adventure and far-reaching accomplishment and so they achieved the rank in discovery and exploration that is willingly accorded to them in so many other fields of human effort.

INVENTIONS

ITALY is conceded by all to have done supremely wonderful work in the arts and at least those with such literary attainments as have carried their interests beyond the narrow bounds of their native tongue in search of great thought and its expression, know the value of Italian literature. In recent years with the development of the history of science her high place as a contributor to scientific knowledge has come to be better appreciated, but in spite of all this there remains, in the minds of most people outside of Italy who think they know Italians the best, the thought that the natives of the peninsula are, after all, an impractical people in the sense of having no great facility in applying their knowledge and their genius to the ordinary affairs of life. As not a few in our time seem inclined to think that the measure of a nation's progress can be estimated by the number of inventions, that is, ingenious applications in scientific knowledge or clever mechanical devices for the comfort or convenience of mankind which its people may arrive at, Italy has been pushed into the background. So far as this mode of human ability is concerned, they are persuaded that Italy has shown very little power of achievement.

They would be quite willing, most of them, to confess that under the circumstances, occupied as her people were with great art and the finest arts and crafts, as well as with the discovery of great principles in science and with the discussion and solution of deep problems in philosophy and education, Italy was not so much to blame for her failure in this practical department of human life, but at least they would ask for the admission of this failure as representing the im-



FORTITUDE, TRUTH AND TEMPERANCE

Raffael in Vatican

practical nature of the people, or as surely arguing a certain impractical strain in them which set them definitely behind most modern peoples. It is as if the finer qualities had been developed at the expense of some of the coarser fibres of humanity, though these latter are extremely important for the great mass of humanity. They would have the feeling that Italy has a certain lack of up-to-dateness, as it were, that indicates imperfect evolution into modern ways, and therefore a failure of her people to take the place in the modern world which they had so richly deserved in the older time, when men were more interested in art and aesthetic achievements generally than they are at the present time.

The surprise for anyone who delves even a little into the history of inventions is to find that in spite of Italy's pre-occupation with so many other higher and more important interests, Italians must be credited with more inventions that have been extremely useful to mankind than any other people. In every department of science and in every phase of life there are marvelously useful instruments and universally appreciated appliances in use which we owe to Italians. Some of these are now so commonly employed and have been with us so long that we do not think of them at all as inventions, or of their discoverers as inventors. These facilitations of human energy have become, as it were, a portion of the universal heritage of mankind. It would be futile to hope to make a full list of these and space would not permit it, but the mere mention of even a few of the things that Italians have devised for the benefit of the race will make it clear how substantial is their claim to be the most inventive of peoples.

The inhabitants of the Italian peninsula began very early to make useful inventions. We do not know much about the old Etruscans, the earliest inhabitants of the central portion of the Italian peninsula, of whom we have definite records, but there has been dug up from their tombs some striking evidence of their inventive ability. Their pottery and its forms and the designs for its decoration, as well as the decoration of their tombs is eminently original and beautiful. Some

of the most beautiful jewelry ever seen has also come from these tombs. In our time what is called jewelry consists almost exclusively of precious stones. This is not jewelry at all for jewels are objects of art, fashioned by the hand of man in precious metals or in a combination of metals and precious stones until they have become things of beauty and sources of joy by their artistic quality. Our so-called jewelry is meant to produce envy, not pleasure, in the beholder. What has been found in the Etruscan tombs is genuine art jewelry. An even greater surprise for the modern time is the remains of the dentistry of the Etruscans. They did fine bridgework in gold, cut from the jaws of young calves the as yet unprojected teeth in order to secure unworn artificial teeth of suitable size, and generally did cosmetic work of great value in a very practical way on the teeth. All this some six or even seven centuries before Christ.

The Romans have left us a series of inventions that are of great significance. Like the Etruscans they too did much more dentistry than we are apt to think of as possible so long ago. Only that we have specimens of gold caps for teeth and other prothetic dental work in gold in the Italian museums, it would be extremely difficult to convince our generation that the inventive enterprise of our dentists had been anticipated so long ago. One of the Laws of the Twelve Tables at Rome forbade the burying of gold with a corpse. Gold was scarce at Rome and the Romans were maintaining in quite modern fashion their gold reserve. A special exemption was made of such gold as was fastened to the teeth, showing how common must have been prothetic dentistry in this metal. We have the story a little later in Roman history of the transplantation of teeth from the mouths of slaves to their mistresses, and a number of instruments of various kinds for the cleaning of the teeth, as well as formulas for tooth powders and washes have come down to us. One of the great surprises for modern times that came with the excavation of Pompeii was the discovery of a series of surgical instruments, most of them made

on principles that were thought to be distinctly modern, and to represent inventions of very modern times.

The Roman use of cement in its best form, some of their constructions remaining down to our time in spite of all sorts of vicissitudes and their effective structural work generally, shows their very practical quality. The rivers of Italy are especially treacherous yet. From the earliest times there is the history of bridges spanning them, some of which were very beautiful in their construction, often lasting for many centuries. The Roman aqueducts still stretch across the Campagna in spite of the vicissitudes of time and exposure, as well as the effects of human destructiveness at many times. Twenty centuries have not buried their handiwork or pulled it apart, showing how thoroughly they had solved the problems of mortar and cement. Some of their tunnels are triumphs of inventive constructiveness.

Passing over these for the moment because as a rule they are not thought of as Italian, though at least so far as regards the Romans they are to all intents and purposes the same people as those who now inhabit the peninsula, we find that with the birth of modern Italy there is a wealth of inventions that have greatly facilitated the accomplishment of many things and added certainly to the convenience, and supposedly at least, to the happiness of mankind.

By far the greater part of all the most important inventions in the department of optics are due to Italians or were developed by them. To them we owe the invention of spectacles for common use, an invention that was made toward the end of the thirteenth century. Lenses had been known for many centuries among the Greeks and Pliny even mentions the fact that the Roman Emperor Nero used some sort of a contrivance by which the combatants in the amphitheatre were brought close up to him, representing as Wendell Phillips emphasized in his oration on *The Lost Arts* an anticipation of our opera glass. During the Thirteenth century Roger Bacon developed the theory of lenses and pointed out some of their applications, but it was a Florentine Salvino de Armati, who

near the end of the century put the rims on lenses and invented the frames by which they are held before the eyes. Here was a very simple invention which meant so much for mankind that it is very hard to understand now how the world ever got on without them. More than one half of those who are above forty years of age would be able to read only with the greatest of difficulty if they had no spectacles. Not a few younger people would be seriously affected in their power to study, and with advancing years most men and women of the world would be deprived of all the consolations of books and not a little of the pleasure of the intellectual and artistic life only for this Italian invention, so simple as to be obvious once it was made, and yet though conferring lasting benefit of the highest sort on men had never been thought of before. The new invention rapidly spread, as might have been expected, and we find Arnold of Villanova and Guy de Chauliac, both of whom had studied down in Italy, recommending in the next generation spectacles to their patients.

Other inventions in optics are scarcely of less significance. The Camera Obscura is commonly said to have been invented by Leonardo da Vinci, and was certainly perfected so as to be quite ready for application to the uses of photography by Giovanni Battista della Porta of Naples, who also anticipated the opera glass, 1590. To Italy also we owe the stereoscope, by means of which the solid and spacial vision of the two eyes is so closely simulated. In connection with this also in Italy came the invention of the reflecting stereoscope, the so-called magic lantern.

The greatest of Italian inventors is that marvelous practical genius who is at the same time almost the greatest of artistic geniuses that the world has ever known, Leonardo da Vinci. In every mode of activity that he took up, he left behind him facilities by which others would be able to accomplish ever so much more easily than before, operations that he had found difficult until he set to work to simplify them. The famous letter from him in which he advertises his talents

INVENTIONS

to the rulers of his day shows that he thought of himself as an engineer rather than as an artist. He was given a contract for digging canals and proceeded to revolutionize the modes of excavation that had been in use up to that time. The old method of carrying dirt out of excavations in baskets on the shoulders of men was entirely too slow for him, so he invented the wheelbarrow. When his cuttings became deeper and rock had to be excavated the wheelbarrow was of little use, so he invented the moveable derrick and later the self dumping derrick. He then invented locks for canals and we have from him the sketch of a scheme by which the water in rivers, very low during the summer time might be maintained high in a channel for navigation purposes. He invented various instruments of war, scaling ladders and means of repelling besiegers and a tread mill catapult for firing a rapid succession of heavy missiles and various arrangements for throwing down scaling ladders. He is said to have been the first, at least in modern times, to use a cofferdam for building foundations at the edge of the water, and announced his ability to obtain a secure foundation for fortifications in this way. Some of his under water structures are said to be still in existence.

He improved nearly all the technical modes in the arts in which he engaged. He boasted of being able to cast anything in bronze and he certainly simplified a number of the processes. The machine for sawing marble, which is still used at the great marble quarries of Carrara was invented by him. He invented machines for lifting large monolithic pillars and statues and setting them in place. Various improvements in the mixing of colors are attributed to him and he experimented with various cleansing agents for brushes and made a special kind of strong lye. There was evidently nothing in construction work that he was not quite sure that he could do, and when it is realized that he had none of the modern mechanical means which facilitate the lifting and placing of building materials, it will be readily understood what difficult problems the architectural engineer of that time had to face.

The Italians of the fifteenth and sixteenth centuries

were quite capable of building structures of the largest and most imposing kind by the simplest means. It was at this time that the form of scaffolding, fastened together by ropes which has been used in European countries ever since came into existence. Michelangelo declared that he could build anything that he could plan, and it needs only a glance at some of the finished structures to realize that this was no idle boast. The story that is told of him with regard to St. Peter's when the Pope insisted that Michelangelo should take over the completion of the Basilica may be apochryphal, but if it is not true it expresses exactly Michelangelo's confidence in his own constructive ability. The Pope said that he wanted to have in St. Peter's a great Christian monument more imposing than any which the imperial Romans had left at the height of their power, and Michelangelo is said to have declared that he would put the Pantheon on top of the Colosseum thus combining the two greatest Roman monuments. That is literally what St. Peter's is, and the dome of it is one of the greatest monuments of constructive ability that has ever been raised.

Nearly all the inventions in art come from the Italians. Fresco painting was developed by them and they worked out the materials for colors. Oil painting probably was originated in the Netherlands, but was magnificently developed in Italy. What they accomplished for color work of all kinds can only be properly appreciated if the whole round of the arts and crafts in which color is used is studied. What the Venetians did in the enduring coloration of glass has remained unrivalled in the history of the world. It is no wonder that the Venetian painters accomplished so much in colors. The illumination of books, the dyeing of textiles, the use of color in needlework and in decorations of all kinds, all these we owe more to the Italians than to any other nation, and their taste in color composition in contrast was unfailing. It is almost literally true that some of these wonderful inventions of the medieval period in Italy must be counted among the "lost arts." They knew how to burnish gold leaf as applied

INVENTIONS

to manuscript so that it maintains its brightness in a way that we can not do at the present time, and some of their colors for illumination work, notably their blues, retain their pristine beauty though ours so soon fade. Italian glass coloration had secrets in the older time that had been lost, and have not as yet been recovered in spite of extensive experimentation in the modern time.

To Galileo is usually attributed the invention of the telescope. Some serious doubts have been thrown during the past generation on his priority in the use of the telescope, and perhaps the original idea is due to a Hollander. There is no doubt at all however, that Galileo had never seen a telescope as made by anyone else, that at most he had heard in a general way of what had been done in the Netherlands when on the strength of his knowledge of optics he took two lenses, arranged them so as to give magnification and apparent approximation of distant bodies. He must above all be given due credit for the invention, because he worked out all the problems in the practical application of this new instrument to astronomy, while those who anticipated him scarcely dreamt of its possibilities in this way. Before his time the telescope had been scarcely more than a toy; in his hands it became a great scientific instrument, by which the distant portions of the universe were brought so close to man that his study of them was greatly facilitated.

The story with regard to the microscope is very similar to that of the telescope. The compound microscope was invented in the Netherlands, but an Italian, Father di Torre, showed how much could be accomplished by means of the simple microscope when skillfully made. He employed globules made by fusing the ends of thread of spun glass as lenses. Later on many of the improvements that made the compound microscope the marvelous instrument that it is at present came from the Italians. Professor Amici of Modena made the first attempts at the achromatization of microscopic objectives and laid down the theory by which this might be successfully accomplished. To Amici also we owe the

introduction of the immersion system in microscopic observation. He pointed out that "the introduction of a drop of water between the front surface of the objective and either the object itself or its covering glass would diminish the loss of light resulting from the passage of the rays from the object or its covering glass into air and from air into the front glass of the objective. It was found on applying this principle of the immersion lens that not only was the great loss of light obviated, but further the immersion system allows of a greater working distance between the object and the objective than can be attained with a dry or air objective having the same angular aperture; and this increase affords not only a greater freedom of manipulation, but also a greater range of penetration or focal depth, and the observer is rendered much less dependent upon the exactness of his over correction." (Carpenter.) In a word these two suggestions of Amici, achromatization and lens immersion have done most to make the compound microscope the practical scientific instrument it now is, especially as regards the use of the higher powers.

Above all it is to Italians that we owe most for the application of the microscope to the most important human problems, those relating to the constitution of the tissues of mankind. Malpighi after having studied the composition of plant tissues, studied the cells of plants and set himself to the microscopic investigation of human tissues and discovered the Malpighian bodies in the spleen and kidneys, described the capillaries and laid the beginnings of comparative physiology. As a result his name is, as we have said, deservedly attached to more structures in the human body than that of any other. Father Kircher in Rome was led by the use of the microscope to divine the existence of microbes and gave us the first scientific ideas with regard to the prevention of epidemic disease. Father Kircher himself invented the magic lantern and a whole series of interesting instruments for demonstration purposes in the teaching of the science.

Italy has been especially prolific in the invention of

facilitations for education. The astronomical clock was invented in Italy and various combinations of mechanical moving spheres to illustrate astronomy. Father Kircher's works, and he published textbooks in nearly every department of science, On Magnetism, On Light and Shadow, on Music, On Sound, On the Art of Harmony and Discord, On Astronomy, On Geology as well as on other phases of science are full of most ingenious inventions illustrated by sketches to help the teacher to demonstrate scientific principles. It was he who invented the idea of having a scientific museum and making collections of all sorts of objects for scientific teaching purposes. The great Kircherian Museum is still in existence, though it has suffered much from political vicissitudes in Italy and especially those by which his order (the Jesuits) was suppressed and driven out at various times, it still enables us to understand the wonderful practical genius of this man of science. He was not himself an Italian but a German, but all his work was done down in Italy with Italian encouragement and patronage.

The Italians have given the world more suggestions for important scientific instruments than all the other nations of Europe put together. Most of the physical instruments for the exact measuring of natural phenomena of various kinds are Italian in origin. It is to them that we owe the invention of the thermometer, and to them also the barometer must be ascribed. In connection with the barometer came the invention of the first air pump and the detailed study of the Toricellian vacuum with all its significance for the measurement of air pressure.*

* The barometer is an invention of Toricelli and the hint for its invention came in a very interesting way, which illustrates the practical inventiveness of the Italian mind. A very deep well near Florence had been fitted with a pump, but it was found that in spite of the most careful fitting of piston and valves the water could not be made to rise higher in the tube than thirty two feet. Toricelli who was official scientist to the court was asked to explain this surprising paradox, for everyone thought that suction, as it was called, if only exerted with force enough could raise water to any height. "Nature abhors a vacuum," it was said, and water would rush in to fill any space out of which air was taken. Toricelli reached the conclusion that the air had a definite pressure and that it was this which caused the water to rise but only to the extent of the pressure of the air. He demonstrated this by sealing one end of a tube filling it with mercury and then being careful to exclude all air he inverted it in a basin containing mercury. The mercury in the tube instantly sank to a level of about thirty inches above the level of

Galileo's inventions alone would do credit to any country. He observed the oscillations of the swinging lamp in the Cathedral of Pisa and utilized the isochronism which he noted for an astronomical clock. He suggested its use for the measuring of successive intervals of time and his studies on the pendulum led to its employment for many scientific purposes. He threw out a hint for the study of the human pulse by it, an important factor for modern medicine. He established the laws of falling bodies as they are still formulated, demonstrated the laws of projectiles, and largely anticipated the laws of motion as finally established by Newton. We have from him a series of telescopic discoveries and inventions relating to astronomy. He could have accomplished all this only in the midst of encouragement and liberal patronage and quite contrary to the usually accepted notion of bitter persecution "Galileo's long life" as Bertrand the Perpetual Secretary of the French Academy of Sciences declared, "must when considered as a whole be looked upon as one of the most serene and enviable in the history of science."

It is to a great worker in science in Italy that we owe the invention of the vernier, the important little instrument without which it would be so difficult to make many of the exact observations of all kinds in laboratories. Until comparatively recent years the invention of this extremely useful appliance has been attributed to Vernier the Frenchman after whom it is named, though the claims of Nonius have been insisted on. Brencing has, however, recently pointed out in the *Astronomische Nachrichten* (Vol. XCVI p. 131) that "we are indebted to no other than Clavius the papal astronomer who corrected the calendar for Pope

the mercury in the basin. This left above the column of mercury in the top of the tube a vacuum which is the most perfect that can be obtained. He at once demonstrated a great principle, corrected a false scientific conclusion and invented a most useful instrument for measuring the weight of air, for this simple apparatus needs only a scale to be a perfect barometer. How much this instrument has meant for mankind in all the 270 years since its invention I need scarcely say. We are rather proud of the saving of life and property by weather reports in our time, but these are all founded on the information obtained from the barometer. The additional information obtained from the thermometer is also due to an Italian invention.

INVENTIONS

Gregory XIII for the theory of Vernier subdivision as well for linear as for circular measurement." He then quotes in full the passages in Father Clavius' works which prove his assertion and which in some inaccountable way have been overlooked. Clavius was of course a German by birth, but he did all his important work in Italy, finding down there the encouragement and patronage which enabled him to accomplish to best advantage the great achievements his genius suggested.

Nearly all the accessories of the modern theatre were invented by the Italians. In the chapter on architecture the story is told in some detail. The Venetians first constructed the theatre with two tiers of boxes arranged circularly round a pit sloping backwards as at present and Fontana, a generation later, invented the horseshoe form. Baldassare Peruzzi at Rome had invented the painted moveable scenes and then added the recessed stage with the frame around it which makes the representation a picture as it were. A great many stage effects were introduced by the Italians, storms and wind and rain and snow, and we hear even of a very lifelike earthquake being represented before the end of the fifteenth century. Nearly all of the picturesque elements in theatricals come from Italian sources. They solved the problems of how to have as large a number as possible in a theatre to hear the human voice and see the human countenance and yet seat them in reasonable comfort. La Scala at Milan, built by Piermarini nearly 150 years ago, is thought by some authorities to be the best made theatre in existence. The San Carlo at Naples built nearly 200 years ago and rebuilt in its original plan about 100 years ago was the model for the Scala and for many other theatres in Europe.

Most people know that we are indebted for a great many of the developments in music to the Italians, yet few realize how many epoch-making inventions and discoveries relating to music come from Italy. The scale was invented down there and almost needless to say this represented a cardinal

discovery for the evolution of music. Plain chant is of Italian origin and literally thousands upon thousands of melodies of all kinds, that is successions of single notes that for some reason not easy to understand appealed to the human ear have been there arranged. Harmony and counterpoint were developed in Italy, oratorio and opera were invented, comic opera and musical comedy received their development and opera houses suitable for the production of these various kinds of musical dramas constructed. Musical instruments were improved, the orchestra received its evolution until there is scarcely a department of music of any kind in which Italians are not the most significant pioneers.

As might well be expected from what they accomplished for music in other ways the inventions of Italians in musical instruments are many and various and most important. The violin in the form in which we have it comes entirely from their hands and it is besides to Italian makers that we owe the perfection of these instruments. The violins of Guarneri and above all of Stradivari have never been excelled. Indeed a Stradivarius remains a most precious treasure at the present day, two centuries after its manufacture, not because of its antiquity, but for its marvelous perfection of tone. In the piano the most important mechanical device is the hammer action which changed the old spinet into the modern piano. This hammer action was first constructed by Bartolommeo Cristoforo in 1711.

We are prone to think of electricity as a modern development in applied science and unless we have some special knowledge of the history of science are not likely to think of the Italians as having been an important factor in its evolution, yet it is probably not too much to say that in electrical inventions Italy leads the world. Father Beccaria was the first to invent a series of electrical instruments that demonstrated how well the energy might be applied which up to this time seemed scarcely more than a mode of physical activity to be employed in toys. Priestley, the well known

INVENTIONS

English discoverer of oxygen, in his *History of Electricity* has praised Beccaria's ingenuity and has described some of these rather striking instruments. Galvani demonstrated Galvanism and opened up a whole new vista in science. Volta invented the Voltaic pile, the first continuous source of electricity that men ever had and for that reason sometimes spoken of as a greater invention than the steam engine. In the light of modern developments in electricity in the mechanical world, this expression now seems to have much more truth than when it was originally uttered. Volta also invented the gold leaf electroscope and a number of very ingenious instruments for the demonstration of certain physical phenomena. Nobili invented the thermopile and the thermo-electroscope, while at the end of the nineteenth century the Italian Marconi had the practical inventive genius to bring together a series of discoveries that had been made by others and combine them in such a way as to make wireless telegraphy with its wonders possible.

While the Italians are not usually associated with modern naval development some of the most important evolutions in naval vessels have been suggested from Italy. In the mid eighties they made the first very large iron clads of the Dandolo type. In the late nineties Cuniberti conceived and designed the battle cruiser type with unit calibre guns in the main battery and with subsidiary batteries and high speed. It was he who also suggested the further development of this into the "dreadnought" and actually went to England with the permission of the Italian government to direct in building the first one of these vessels that was laid down some fifteen years ago. What is now called the Whitehead torpedo, that is the type of torpedo self moving under its own power and dirigible, was invented by an Italian naval officer whose ideas were developed by Whitehead working at Fiume among an Italian people, as recent history proclaims them.

Italy must yield to Germany's claim for priority in the invention of printing, but while the Germans invented, no

nation did so much as Italy for the diffusion of printing, for the development of the art—the real art it very soon became in their hands—and for the encouragement of every detail of fine bookmaking that came with it. Above all Italy was the fruitful mother of inventions that made the printing art of immensely greater value to mankind than it was as it came from the hands of the original Teutonic inventors. Henry Louis Bullen in his articles on the literature of typography makes this very clear. As Mr. Bullen is the curator of our finest museum of typography and as he knows his subjects as no one else at least in America, his paragraph with regard to printing in Italy during the half century immediately after the invention of printing is the best possible tribute to the Italians and their fine workmanship and inventive genius in all that regards printing that we have. He said in *The Inland Printer* (November 1914):

“From 1465 to 1501—thirty-five years—printing was established in seventy-three Italian cities. *Each printer had to make his own presses and types and cases and other appliances*; there were no manufacturers or merchants making or selling these necessities. Sixteen hundred and eighty (1,680) distinct type-faces have been identified as the product of the Italian printers in that brief period, including the most beautiful Roman and Text types ever used, and the first Italic. Was ever a greater boon in the printing industry? Was ever an art more eagerly adopted? Printers outside of Germany have been influenced more by the early Italian workmanship than by the German. Every printer or typesetter among us is the debtor of the earlier Italian printers, none the less so if unconscious of the obligation and ignorant of the benefactors.” When William Morris, in the last generation, set himself to redeem the modern time from the disgrace of being the makers of the ugliest books ever made, he went back to the work of the early Italian printers for the models for his bookmaking. Anyone who knows how revolutionary was the work of Morris himself will realize how much of influence this reversion

to the Italian printing meant. Anyone who has tried to purchase a volume printed at the Kelmscott (Morris') press will be brought to the recognition of how much our generation learned to appreciate in the very practical way of paying high prices for them, Morris' imitations of the work of the printers of Italy of the very first generation of printing.

Bullen says further "We owe to Italy the first books in Greek and Hebrew types. The first complete fonts of Greek types were used in Rome in 1465 and in Venice in 1472, as quotations in Latin text. The first book in Greek was printed in Milan in 1476. Before Aldus' first book in Greek (1495), thirty-four Greek books had appeared in Italy. Aldus gave us the cursive model of Greek types that has generally prevailed until our time; prior to his types the Greek models were crude. The first books in Hebrew appeared in Italy in 1475." Almost needless to say these represent inventions in the making of types which were to influence deeply all the after time.

Some idea of their practical genius in printing may be obtained from the fact that they invented paragraphing in print as we now have it, introduced pagination, invented capital letters, first arranged punctuation and added all those features which make the modern printed book so much more easy to understand than the old manuscripts or even the first books that were printed. To them too we owe the title page with the information that it now conveys at a glance and many other features that are real discoveries.

Paper was not invented by the Italians, but by the Orientals, but its manufacture was greatly developed and improved by them and furnished an extremely important adjuvant for the art of printing. Paper made from cotton was invented in Asia, but the oldest document written on cotton paper extant is a deed of King Roger of Sicily of the year 1102. Certain of the records of the Venetian government were kept on cotton paper early in the thirteenth century. There is an example of a manuscript in the British Museum written on an excellent paper in an Italian hand

WHAT CIVILIZATION OWES TO ITALY

in the first half of the thirteenth century. Fabriano of Ancona made excellent paper early in the fourteenth century and the extant manuscripts on Italian paper from that period excite admiration for its good quality even in our day. Most of the North Italian cities took up the manufacture of paper about this time and their product became famous all over Europe. It was they who developed the making of rag paper and also linen paper. About the middle of the fourteenth century the use of paper for all literary purposes became well established in Italy and gradually spread all over Europe.

What needs to be well recognized, however, is the fact that Italy's inventions were not limited in any way to merely material things. There are a great many inventions which represent short cuts of various kinds for the accomplishment of mental processes and in facilities of this kind the practical genius of the Italians has been particularly fruitful. It was they who invented the various processes in arithmetic that have so simplified calculations. Anyone familiar with the older processes will realize indeed that these were great time saving inventions. It is to them also that we owe as is made clear in the chapters on Mathematics and Astronomy the algebraic solutions of equations of various kinds that had seemed impossible or could be done only by long time taking guess work before the Italian mind ordered them.

Index

Index

A

Abaci Liber, 205
 Abacus, 204
 Abbesses in parliament, 123
 Abelard, 128
 Abella, 129
 Abellino, 160
 ability, inventive, 399
 Abruzzi, Duke of, 396
 Abruzzi, farthest North, 396
 Abusimbel, 395
 Abyssinia, 385
 Academia, della Crusca, 150
 Academies, 110
 Academies, Italian, 148
 Academy, French, 357
 Academy of the Lincei, 150
 Academy, Roman,
 Accademia dei Lyncei, 356
 Accademia delle Belle Arte, 364
 accomplishment, feminine, 334
 achievement and leisure, 187
 Achilles Statius, 155
 Achillini, 242, 249
 Addison, 272
 Adorno, Giuliano, 347
 Aeneas, Sylvius, 140, 156
 Africa, 396
 Age, Augustan, 324
 Age of Leo X, 324
 Age, Periclean, 324
 ages, "dark," "bright," 109
 Ages, Golden, 363
 Agnesi, Maria Gaetana, 211, 354
 Aida, 56
 Aix, 88
 Alaric, 365
 Albategnius, Astronomy, 214
 Alberti, Leon Battista, 142, 152,
 Albertoni, 261
 Albertus Magnus, 110, 174, 321
 Albigenses, 319
 Aldi, Neacademia, 144
 Aldrovandi, 280
 Aldus, 374, 413
 Alduses, 134
 Aldus Manutius, 144
 Aleppo, 394

Alexander, 331, 153
 Alexander of Hales, 171
 Alfieri, xiv, 94
 Alfred, King, 166
 Alhambra, 36
 Allbutt, Prof., 272, 293
 Almagest of Ptolomy, 214
 Alma mater, Italy, 203
 Alpin, 305
 Alpini, 284
 Amati, 58
 Ambrose, a second, 329
 Ambrose, St., 47, 77, 78, 167, 189
 Americus, 380
 Amerigo Vespucci, 379, 380
 Amici, Prof., 405
 Ammanati, 28
 Ampere, ix
 Anaesthesia, 289
 Anatomical names, Italian, 248
 Anatomists, Renaissance, 245
 Ancona, 360
 Anderson, 106
 Andrea de Cione, 26
 Angelo, Fra, xi, 14, 139, 362
 Angulara, 262, 284
 Animuccia, 51
 Annales Ecclesiastici, 147
 Anselm, xv, 80, 169, 227
 Antelminelli, 260
 Anthemius, 188
 Anthony, 336
 Anthony of Padua, 318, 322, 366
 Anthropometria, 254
 Antioch, 394
 Antiphonal psalmody, 48
 Antiquitates Italicae, 157
 Anti-Semitism, 192
 antiseptics anticipated, 293
 apartment of Isabella D'Este, 72
 Aphorisms of Hippocrates, 305
 Aphorisms of Static Medicine, 303
 Apothecaries and physicians, 196
 Aquaviva, 115
 Aqueducts, Roman, 226, 401
 Aquilana, 250
 Aquinas, St. Thomas, xv, 78, 80, 110
 168, 171, 172, 182, 227, 321
 Arabian culture, 267

INDEX

- Arabian polypharmacy, 267, 284
 Arabisms, 290
 Aranzi, 245, 272, 295, 302
 Arbitrator, Pope Leo XIII, 331
 Arcadelt, 47
 Archimedes, 233
 Architecture, French, 45
 " History of Modern, 43
 " Italian Renaissance, 45
 " Spanish American, 45
 " theatre, 42
 Arcolani, 272
 Arculanus, 296, 298
 Arena at Padua, 12
 Aretino, Guido, 49
 Aretino, Spinello, 14
 Arezzo, Cathedral of, 25
 Arezzo, Guy of, 49
 Argelata, 296
 Arianna, 52, 53
 Ariosto, xiii, 90, 362, 374
 Aristotle, 84, 175, 182
 Aristotle, ethics of, 140, 227, 264
 Arithmetic, 206, 211
 " commercial, 212
 Arithmetica, Institutio, 204
 " Summa de, 207
 Arnold of Villanova, 402
 Arnold, Matthew, 314
 Arnolfo del Cambio, 26
 Arrian, 114
 Art Byzantine, 24, 374
 " public, 111
 " sense, 70
 Arts, Lost, 226, 401, 404
 Arts and Crafts, 60
 Ascoli, 159
 Ascoli, Cope of, 65
 Asepsis anticipated, 301
 Assissi, 34, 314, 360, 371
 " maid of, 341
 " St. Francis of, 3
 " Market Place, 372
 Assouan, 395
 Astronomical clock, 408
 Astronomy, Albategnius, 214
 Athens, 359
 Athletics, 113
 Attila, 323
 Augusta Perusia, 372
 Augustan age, 324
 Augustine St., 77, 92, 165, 167, 322
 Augustine St. of England, 48
 Augustus, 386
 Aurispa, 137
 Ausonius, 142
 Author, vocation, 346
 Autocracy, 362
 Autocrat, 363
 Avignon, 343
 Avignon to Rome, 323
 Avogadro, xvii, 237
 Ayala, 274
 Ayrton, Mrs., 356
 Ayrton, Prof. W., 356
- ## B
- Babylon, 359
 Baccio, Bandinelli, 28
 Baccius, 275
 Bacon, Francis, 91, 178, 229
 Bacon, Roger, 110, 204, 315, 401
 Badia, 253
 Baer, Von, x
 Bagdad, 394
 Baglioni, 373
 Bailie, 272
 Balbi, Statues of, 376
 Balduccio, de Pisa, 27
 Ball, 212
 Bank of St. George, 369
 Bannerman, 106
 Banti's Disease, 285
 Baptistry of Florence, 26, 64
 Barbarano Palace, 377
 Barberini, Cardinal, 181
 Barbieri, 44
 barometer, 407
 Baronius, 147, 327, 329
 Bartoletti, 277, 278
 Bartolommeo, Fra, x, 14, 362
 Basedow, 285
 Basilica of Constantine, 95
 Bassi, Laura, 211, 354
 Bateson, Miss, 124 (note)
 bathing bag, 305,
 Beatrice, 340
 Beatrice D'Este, 350
 Beauty defined, 51
 Bec, monastery of, 170
 Beccaria, xvii, xviii, 235, 410
 Begarelli, 30
 Belisarius, 373
 Bellarmine, 148
 Ballarmino, 147
 Bellingham, 278
 Bellini, 367
 Bellini, John, xi, 19,
 Bellini, Vincenzo, 56, 74
 Beltraffio, 370
 Belzoni, Giovanni Battista, 395
 Bembo, 236
 Bembo, Cardinal, 131, 141,
 Benedetti, Alexander, 242, 272
 Benedetto da Maiano, 28
 Benedictine nunneries, 100, 122
 Benedictine nuns, 310
 Benedictines now, 312
 Benedict, Friar, 389
 Benedict XIV, Pope, 158, 211
 Benedict of Nursia, 122, 309
 Benedict, St., 99, 338
 Benivieni, 272, 278

INDEX

- Benozzo Gozzoli, xi, 14, 16
 Bentivogli, 365
 Benvignate, 372
 Beowulf, 166
 Berengar of Carpi, 240, 272, 296
 Berenson, 11
 Bernardino of Feltre, 317
 Bernardino of Sienna, 317
 Bernini, xii, 32
 Bernouilli, 210
 Berry, 218
 Bertrand, 408
 Bessarion, Cardinal, 169, 216
 Bianca & Fernando, 56
 Biela's comet, 222
 Bindings, Italian, 66
 biology, Italian, 238
 biology, Pliny, 227
 Biondo, 301
 Bishops' Schools, 101
 Black Death, 329
 Blake, Wm., 85
 Blondus, 301
 Bobbio, 158
 Boccaccio, 88, 89, 137, 362
 Boccacino, 274
 Bode, 221
 Boerhaave, 264
 Boethius, 135, 165, 204
 Bognoni, Bunyan, 382
 Bologna, 136, 343, 360, 364
 bologna pudding, 364
 Bologna, University, 105
 Bologna, women students, 130, 340
 Bombelli, Raphael, 208
 Bonagentibus, 274
 Bonaventure, xv, 110, 176, 315
 Bondi, Flavio, 137
 Boniface VIII, 194
 Boniface of Tuscany, Marquis, 339
 Boniface, VIII Pope, 84
 Bononia, 365
 Books of Hours, 65
 Borelli, 253
 Borgeron, 389
 Borghesi, 160
 Borgia Lucretia, 74, 352
 Borgia, Lucretia, saint, 353
 Borneo, 390
 Borromeo, St. Charles, 327, 371
 Boscovich, 220
 Bosio, Antonio, 161
 Boston Public Library, 5, 42, 63
 Botallo, 248, 295
 Botanical Gardens, 283
 Botanic Gardens, 261
 Botany, Italian, 255
 Bothriocephalus latus, 281
 Botticelli, xi, 14, 50
 Boucaud, Prof., 189
 Bowden, Father, 326
 Bozio Tommaso, 327
 Bracciolini, Poggio, 137
 Bramante, 370
 Branca, 298
 Brencing, 408
 "bridge of sighs," 368
 Bright, 272
 "bright ages," 109
 Brigid St., 121
 Brownson, Orestes, 168, 171
 Brunelleschi, 189, 362
 Brunetto Latini, 81
 Brunfels, 255
 Bruni, Leonardo, 137
 Bruno, 292
 Bruno, Giordano, 179, 180
 Bruzza, 160, 161
 Budaeus, 154
 Bullen, Henry Louis, 412
 Bunyan, John, Italian descent, 382
 Buonaparte, 330
 Buoncompagni Ludovisi, 207
 Buonsegna, 372
 Burckhardt, 350
 Burmah, 385
 Byron, 94
 Byzantine, 24
 " art, 374
 " decoration, 163
 " style, 36
 Byzantium, x, 4

O

- Oabeo, 236
 Cabots, John & Sebastian, 380
 Cabotto, Giovanni, 380
 Cabral, 296
 Cabrini, Mother, 132
 Caccini, 52
 Caesalpino (see Caesalpinus)
 Caesalpinus, 245, 251, 256, 295
 Caesar, 386
 Caetani Bovatelli, Ersilia, 356
 Caetani, Sermonetta, Duke Michelangelo, 356
 Caius, v, xviii, 116, 141
 Cajori, 205
 Calcar, 245
 Calcutta, 390
 Caldwell, 345
 Calenda, Constanza, 129
 Calendar, correction of the, 323
 Calepino, Ambrogio de, 151
 Callahan, 106
 Cambaluc, 390
 Cambio, Arnolfo del, 362
 Cambio, Sala del, 373
 Cameos, Renaissance, 71
 Camera Obscura, 402
 Camerini of Isabella D'Este, 74
 Camoens xiii
 Campanella, 179, 181

INDEX

- Campbell, 106
 Campo Santo, 14, 376
 " " in Pisa, 68
 Campus Martius, 336
 Canaletto, 21
 Canalis, 261
 Cananus, 250
 Canaries, 393
 Cannae, 365
 Canon Law, 193
 Canossa, 321
 Canossa, Matilda of, 336
 Canova, xii, 32
 Cansay, 390
 Canton, 390
 Cantor, 207
 Capobianco, 261
 Carracci, 364
 Caravaggio, 20
 Cardan, Jerome, 208, 230, 254, 274
 Cardano, 179
 Carducci, 95
 Carissimi, Giacomo, 53
 Carlyle, v, xiii, 86
 Carmichael, Prof., 179, 230
 Carpaccio, Vittore, 19
 Caroline Islands, 331
 Carpi, 375
 Carpenter, 406
 Carracci, 20, 364
 Carrara, 403
 Cartesianism, 168
 Carthage, 62
 Cartoons, Raphael's, 71
 Caspian, 388
 Casserian perforating, 248
 Casserio, 247
 Cassini, 220
 " division, 220
 Cassidorus, 135, 166, 204, 265
 Castellani, 286
 Castelli, 232, 257
 Castiglione, Baldassare, 92, 374
 Castile, New, 380
 Catarina Scarpellini, 356
 Catherine Benincasa, 342
 " of Bologna, 335
 " of Genoa, 335
 " of Pisa, 345
 " Saint of Siena, 335, 342, 345
 " word, 344
 Cato, the elder, 76
 Cattolica Civiltà, 354
 Catullus, 76, 145, 155
 Cavalari, 160
 Cavalcanti, Guido, 81
 Cavalcaselle, 17
 Cavalieri, S. J., 209, 210
 Cavalleri, 261
 Cavalleria Rusticana, 57, 96
 Cavedoni, 160
 Cecco D'Ascoli, 215
 Celestine V., 373
 celibacy, 190
 Cellini, Benvenuto, 28, 30, 70, 92, 254
 Celsus, 142, 226, 355
 cement, Roman, 401
 Centuries, Thirteenth, Greatest of, 388
 Certosa, 351
 Ceylon, 385, 390
 chalices, 67
 Challenger, expedition, 260
 Chant, Plain, 40, 322, 410
 Charlemagne, 365, 373, 375
 Charity, Christian, 337
 Charity, Institute of, 160, 183
 Chaucer, 166
 Chaulic, Guy de, xviii, 116, 129, 240
 294, 402
 Chauvinism, 244
 Chekaeng, 390
 Chicheley, Reynold, 156
 Chiericate, 378
 Christ, The Imitation of, 321,
 Christian, Slavonic, 388
 Christofori, Bartholomeo, 59
 Chrystal, Prof., 235
 Church, attendance, 69
 Church, Dean, 87
 Churches art museums, 69
 ciboria, 67
 Cicero, 77, 97, 114, 136, 164
 Cicero's Hortensius, 165
 Cimabue, x, 3, 340
 Cimarosa, 55
 Cino da Pistoia, 81
 Circulation, Italian, 250
 Ciriaco, 137
 cities, Italian, 361
 "city beautiful," 367
 Clare, St., 321, 335, 341, 371
 Claudio, Monteverde, 52
 Clavius, S. J., Father, 408
 Clement, V., 373, 392
 Clement VIII, Pope, 146
 Clement XIV, Pope, 158
 Cleopatra, 336
 Clyster apparatus, 305
 Cochin China, 385,
 Code Justinian's, 84
 Code Napoleon, 199, 330
 Codice Irlandese, 159
 Codronchi, 305
 Coimbra, University of, 155
 Cole, Timothy, 9, 15
 Coleridge, S. J., 86
 Colet, Dean of St. Paul, 141, 156
 Colla, 208
 college, Roman, 115
 Colleoni at Venice, 29
 Colonna, Vittoria, 349
 Colosseum, 34, 40, 404
 Columbus, 229, 245, 273, 379, 382
 Columbus and Toscanelli, 229

INDEX

Columbus Century, 393
 Columbus Hospital, 133
 Colzi, 260, 261,
 Comedy, Divine, xiii, 166
 Comedy, musical, 410
 comet, 223
 Competetti, 160
 conservation of energy, 228
 Constantine, 4, 186, 266
 Constantine Africanus, 103, 289
 Constantinople, 319
 Contagion development, 274
 contagium animatus, 281
 Contagium vivum, 274
 Conti, 318
 convents, coordinate, 127
 Convito, Dante's, 166
 Conway, Sir Martin, 36, 191
 Copernicus, v, x, xvii, 116, 216
 Cordonedi, 261
 Cordus, 255
 Corelli, 59
 Coriolanus, 61, 336
 Cornaro, 353
 Cornelia Gracchus, 119, 336
 Cornelius' Law, 87
 Corpus Inscriptionum Latinarum, 160
 Corpus Juris Civilis, 191
 Corregio, xi, 20, 50, 374
 Corsi, 261
 Corsini, 157
 Cortesi, 305
 Corti, Marquis of, xxi, 248
 Cortona, Pietro da, 20
 Cosimotura, 19
 Costa, Lorenzo, 19, 385
 Cotugni, 248
 Counterpoint, 50, 410
 "Countess, The Great," 339
 Cowley, 93
 Cram, Ralph Adams, 311,
 Crashaw, 93
 Creighton, 113
 Cremenensis, 205
 crew, 231
 Criminal Science Series, 200
 Criticism, higher, x
 Crivelli, 19
 Cruets, 67
 Culture, defined, 60
 Cuneo, 299
 Cuniberti, 411
 Cur Deus Homo, 81, 170
 Curie, Madame, 358
 Cycloid curve, 208
 Cyprus, 394
 Cytoryctes variolae, 286

D

Dafne, 52
 Damascus, 394
 D'Annunzio, xiv, 95

Dante, xiii, 85, 136, 193, 214, 315,
 340, 357, 362, 374
 Dante and St. Thomas, 173
 Dante da Maiano, 81
 Dante's Convito, 166
 Dante, science, 215
 Dastre, Prof., 260
 David, Michelangelo's, 29
 Davidson, Thos., 117, 183
 Da Vinci (see Leonardo)
 "dark ages," 109
 Deaconesses, 121
 debtors', prison, 318
 Decameron, 374
 De Lugo, Cardinal, 182
 democracy, 361
 Democritus, evolution, 175
 Demosthenes, 114
 De Noailles, 181
 dentistry, Etruscan, 400
 " Italian, 298
 " prothetic, 400
 Denza, 222
 De Renzi, 128, 242, 250, 290
 De Rossi, 160, 356
 derrick, moveable invention, 403
 De Santi, 354
 Descartes, 168, 171, 178, 182
 Desiderius, Abbott, 104
 despotism, 362
 D'Este, Duke of, 352,
 D'Este, Isabella, 72, 74, 351, 374
 De Vico, 223
 De Vinne, Theo, Low, 144
 De-Vit, 160
 Dies Irae, xiii, 49, 77, 81
 Dionysius of Halicarnassus, 159
 Discoverers, Age of, 393
 "Disease, The Seats and Causes of,"
 271
 dissecting room, laboratory, 243
 dissection artists, xix, 240
 dissection, prohibition of, xix,
 Divine Comedy and Summa, 175
 Divina Commedia, xiii, 166, 377
 division, 212
 Dixon, 106
 Dix, Rev. Dr. Morgan, 382
 Dnieper, 387
 Doge, Adorno, 347
 Doge, Genoa, 347
 Dolci Carlo, xi, 20
 Domenichino, xi, 20, 364
 Dominic, St., 321, 322
 Dominic, St., Third Order, 344
 Donnizo, 339
 Don, 387
 Donatello, viii, xii, 28, 362, 365
 Donizetti, 57
 Donne, Maria dalle, 355
 Don Pasquale, 57
 Donzellino, 274

Doria Tedisio, 393

Dosso Dossi, 19, 74

Drama Italian, xiv
dramatists, Greek, 114

"dreadnought," 411

Dryden, 93

Duccio, x, 5, 9

Dunnan, F. H., 322

Duns Scotus, 110, 171, 315

Dunus, 281

Duomo at Prato, 17

Duomo of Milan, 369

Durante, 306

Duse, Signora, 94

E

earth shine, 216

Ecce Homo, 20

Eckstein, Lena, 124,

Edfoo, temple, 395

education, facilitations, 407

" feminine, 113, 118, 334

" graduate, 104

" Jesuit, 115

" monastic, 98

" popular, 101

" "under the crozier," 119

effluvia, organic, 277

Egypt museums, 396

electricity, history of, 235

electroscope, 411

Elephantina, 395

Elizabeth of Hungary, 315, 321

Elsholz, Sigusmond, 254

Encke, 222

energy, conservation of, 228

England, Renaissance, 155

English students in Italy, 115

Ennius, 76

equations, cubic, 208

Erasmus, 141, 148, 153, 308

Ercole Grande, 19

Escorial, 70

Ethics of Aristotle, 140

Etruscans, 2, 372, 399

" dentistry, 400

" pottery, 400

" jewelry, 60, 400

Eugene II, Pope, 101

Euridice, 52,

Eusebius, 147

Eustachius, 245, 249, 268, 272

Eustochium, 121

evolution, 165

" Aristotle, 175

" Democritus, 175

Evora, 155

exchange royal, 42

explorers, Renaissance, 384

Exultet, 49

F

Faber, Father, 326

Fabiola, 336

Fabretti, Raphael, 156, 160

Fabricius da Aquapendente, 243, 295
297

Fabricius inventions, 247

Facciolati and Forcellini, 151

facilitations of human energy, 399

faction fights, 342

faculty, organization of the, 108

fairs, 311

Fallopian, 245, 268, 275, 295, 296, 297

Falstaff, 56

Fano, 261

Fasti Consulares, 160

Farnese Bull, 376

Favaro, Prof. Antonio, 231

Fawn Dancing, 376

Fen Country, 311

Ferdinand III, St., 195

Ferguson, 43, 378

fermentation, 275

"ferments," 277

Fermo, 325

Ferrara, 13, 19, 305, 352, 360

Ferri, Prof. 200

Ferro, Scipio, 208

Festus, 143

feuds, 342

Fiammetta, 89

Fichte, 178, 182, 184

Ficino, 142, 168

Fiesco, Catherina, 347

" Conte Giacomo, 347

Filangieri, 199

Filefo, 137

Filicaja, 2, 93

Fink, 206

Fioravanti, 296

Fiorelli, 160

Fisher, Bishop, 156

Fitting, 193

Flajani, 285

Florence, 13, 359, 343, 362

" Baptistry, 26, 64

" Schools, 101

Fontana, 248, 409

"form", 227

formula for happiness, 309

Fortunate Isles, 393

"Fortune, On the Mutations of", 346

Forum Judicum, 195

Foscolo, Ugo, 94

fossils in true light, 273

Foster, Prof., 251, 253, 258

foundations, pious, 190

Fra, (see name)

Fracastorius, 217, 273

Fracture contrecoup, 291

Francia, 19, 364

Francis, I, 154
 " poetic genius, 314
 " Saint, Life of, 79, 309, 312,
 321, 322, 335, 371, 387
 " Saint, Little Flowers of, 79
 " Saint, Third Order, 315
 Franciscan Rule, 341
 Franciscans, 313, 316
 Free, Dr. John, 155
 Freeman, 171
 Frederick, Duke of Urbino, 138
 Freind, 295
 Friars Minor, 315
 Frigimelica, 250
 Friuli, 24
 Frontenac, 384
 Fuchs, 255
 Fuhkeen, 390
 Fulvio, 146

G

Gaddi Taddeo, x, 14
 Galen, 264
 Galileo, x, vi, 182, 208, 217, 231, 280
 " long happy life, 408
 " swinging lamp, 276
 Galla Placidia, 5, 35, 63
 Galleria Vittorio Emmanuele, 371
 Gallery Brera, 370
 Galliera, Duke of, 369
 Galuppi, 55
 Galvani, xvii, 130, 234, 411
 Gamut, 49
 Ganganelli, Cardinal, 158
 Gardens, Italian, 75
 " monastery, 283
 Gardner, 344
 Garnet, 92
 Garofalo, Baron Raffaele, 19, 200
 Garrison, F., 273, 279, 286
 Garrucci, 160
 Gassendi, 180
 Gattamellata, 28, 366
 Gavassetti, 305
 gems, Renaissance, 71
 Genoa, 360, 368
 " music, 369
 Gentile da Foligno, xi
 Geoffroy, ix
 Geometrica, 204, 206
 Gessner, 255
 Gherardo of Cremona, 205, 215
 Ghiberti, xi, 27
 Ghini, Prof. Luca, 256
 Ghirlandajo, 14, 80
 Ghizeh, pyramid, 395
 Giacomo da Filelfo, 250
 Giacomo della Porta, 28
 Giannone, 199
 Gibbon, 331, 395
 Gibraltar, 393
 Giles, Brother, 315

Giles, Peter, 381
 Gilli, xvii,
 Giocondo, Fra, 377
 Giordana, Luca, 20, 179
 Giotto, x, 3, 11, 315, 362, 372, 375
 " Campanile, 26
 Giovanni, Lothario, 318
 Girald of Cremona, 205
 Girolamo Lombardo, 31
 Gladstone, ix, 85, 164
 Glass, Venetian, 63, 74
 Gley, 260
 Glisson, 249
 Gnomon of Santa Maria, 228
 God intoxicated man, 180
 God, Little Poor Man of, 315
 God, Scourge of, 388
 Goethe, 3, 41, 61, 94, 372
 Goldoni, 94
 Golgi, xxi
 Goodell, 311
 Gosse, Edmund, 89, 93
 Gozzoli, Benozzo, 139
 Goudimel, Claude, 47
 Goujon, Jean, 82
 Gothic Architecture, 39
 Gracchus, Cornelia, 119
 " Gains, Tiberius, 120
 Graecia, Magna, 375
 Graecisms, 193, 290
 Graffiti di Pompei, 160
 Gratian, 193
 Gravity, 231
 Graves Disease, 285
 Greece captive, 62
 Greek masters, 265
 " type, 413
 " in origin, ix
 Green, Edward Lee, 255
 Gregorian Chant, 322
 Gregory II, Pope, 322
 " VII, Pope, 101, 321
 " XIII, Pope, 323, 409
 Gregorovius, 356
 Grentemesnil, 274
 Grew, Nehemiah, 255
 Grey, Lord, 155
 Grimaldi family, 397
 Grimm, 20
 Grocyn, 142, 156
 Guarna, Rebecca, 129
 Guarnieri, 58
 Guercino, 20
 Guerini, history of dentistry, 299
 Guido, Aretino, 49
 Guido Cavalcanti, 81
 Guido Reni, 20
 Guilds Academic, 108
 Guittone Fra, 49
 Gurlt, 247, 289, 291, 294
 Guy de Chauliac, xviii, 116, 129, 240
 294, 402
 Guy of Arezzo, 49

INDEX

Guy of Montpellier, 320
Guzman, 154

H

Hakluyt, 389
Hall, Pres. Stanley, 108, 178, 197
Haller, 243
Hamadan, 394
Handel, 53
Hang Chow, 390
Hankel, 205
Hannibal, 365
happiness, 309
harmony, 410
Harriot, 218
Harvey, vi, x, xviii, 106, 116, 245, 246, 250
Hawthorne, Mother Alphonsa, 345
"Health Rule of," Salerno, 279
Hebrew in origin, ix
" type, 413
Hegel, 171, 184
Helferich, 296
Helmholtz, x
Héloise, 128
Helvetius, 169
Henry III, of France, 329
Henry de Tonty, 383
Herbularia, 283
Herculaneum, 62, 375
Hercules, Farnese, 376
Herodotus, 91, 114, 386
" and Marco Polo, 387
" of art, 92
Herschel, Sir John, 221
Herter, 337
Hesiod, 114
Hilaire, St. Geoffrey, IX
Hildebrand, 321
Hill Country, 2, 34, 341, 372
Hippocrates, 264
Historia, Naturalis, 226
Hobbes, 185
Holmes, O. W., 86, 245
Holy Ghost, hospitals of the, 319
Holy Spirit, " " " 319
Holy Trinity Church in Boston, 38
Homer, xiii, 114
Homerius Juvenis, 143
Horace, 22, 76, 114, 145
Honorius II, 373
" IV, 373
Hortensius, Cicero's, 165
Hospital, Christian, 337
" Columbus, 133
" first public, 336
" German, 319
" helpers, 342
Hrosowitha, 124
Hubert, 15
humanities, 98
Humboldt, Alexander von, 214
Hume, David, 217

Hungary, Golden Bull, 195
Huxley, xv
hydrostatics Roman, 225
Hymn to the Creatures, 313, 316
Hythloday, Ralph, 380

I

Ignatius Loyola, Saint, 115, 132, 326
Illinois, 384
immersion lens, 406
independence, conventual, 126
indestructibility of matter, 228
India, 385
Ingeborga, 320
Inghirami, 222
Ingrassias, 248, 274
Innocent III, Pope, 194, 318, 337
" IV, " 387
Institute of Law, 197
Institutio Aritmethica, 204
Institutions, Christian, benevolent, 337
" Lending, 317
Intermezzo, 54
Inventions of musical instruments, 58
" printing, 412
" wealth of, 401
Irish Codex, 159
Irneria, 340
Irnerius, 193, 197, 340
iron clads, 411
Isabella D'Este, 351, 374
" apartment of, 72
" camerini, 74
Islands, Cape Verde, 393
Isocrates, 114
Ispahan, 394
Italian academies, 148
" gardens, 75
" paper, 414
" theatre modern, 409
" scholarship, 134
" women, 333
" world wide influence, 330
Italics, 412

J

Jacobi, 178
Jacopone da Todi, 78
Jansenius, 169
Japan, 385
Java, 385, 390
Jenghis, Khan, 387
Jerome, St., 121, 167
Jerusalem, 359
Jew, political disabilities, 352
jewelry, artistic, 71, 400
" Etruscan, 60, 400
Jocelyn of Brakeland, v
John XXII Pope, 373
John of Arcoli, 298
John of Bologna, xii, 28, 30
John of Carpini, 387

John, Saint, 386
 Josquin of Hainault, 47
 Jovinian, 169
 Julia, 336
 Julian the Apostate, 190
 Julius Caesar, 331
 Julius II
 Jupiter, satellites of, 218
 " rotation, 220
 Justinian Code, 84, 197
 " Emperor, 190
 Juvenal, 114

K

Kambaluc, 392
 Kant, 171, 182, 184
 " Anticipated, 175
 Karnac, 36, 395
 Kashgar, 385
 Kelmscott Press, 66
 Kelvin, Lord, 235
 Keppler, 221
 Khan of the Tartars, 388
 Khorasan, 391
 Khotan, 385
 Kiev, 387
 Kildare, 121
 Kircher, S. J., 219, 233, 406
 " Text Books, 233
 " corpscula, 276
 Kircher's Museum, 110, 407
 Kreisler, Fritz, 59
 Kublai Kahn, Emperor, 392
 Kuhns, Dr. L. Oscar, 215

L

labor, dignity of, 310
 laboratories, 408
 laboratory dissecting room, 243
 Ladies of Grace, 348
 " " the Italian Renaissance, 348
 Lady Poverty, 313, 316
 Laennec, ix
 La Favorita, 57
 La Figlia del Reggimento, 57
 La Fille du Regiment, 57
 Lagoons, Queen of the, 368
 La Grange, 209
 Lamarck, ix
 Lamari, 261
 Lancisi, 248, 276, 278
 Landino, 142
 Landmarks of Botanical History, 255
 Landriani, 137
 Landsmannschaften, 108
 Lanfranc, xv, xx, 80, 170, 292, (Lanfranchi)
 Lanzi, Loggia dei, 30
 Laocoon, 23, 61
 La Salle, 383
 La Salle and Tonti, 383
 La Scala, 44, 59, 371, 409
 La Somnambula, 57
 Lateran synod, 101

Latin Empire, 318
 Latin folk poems, 77
 Latin hymns, 48, 77
 Latini, Brunetto, 81
 Lauda Sion Salvatorem, 49, 177
 Law, abstract rules, 194
 " Roman, 185, 198
 "Laws, doctor of", 195
 Learning, New, 153, 325
 Lebrixa, Antonio of, 154
 lectus artificiosus, 305
 leisure of the Middle Ages, 187
 " and great achievement, 187
 Leith, 106
 L'Elisire d'Amore, 57
 lending houses, 317
 lens, immersion, 406
 Leo I, Pope, 323
 " X, Pope, 141, 154, 236, 324
 " XIII, Pope, 132, 173, 176, 324, 331
 Leo X, Age of, 324
 Leo XIII, pulpits of world, 332
 Leo, Emperor, 188
 Leonard-of Pisa, xvii, 205, 214
 Leonardo da Vinci, xi, xii, xviii, 28, 50, 152, 374, 402
 Leonardo of Pisa, 205
 Leone, Carcano, 299
 Leopardi, 28, 95
 Lessing, 61
 levity, 231
 Lhasa, 316, 391
 Liber Simplicis Medicinæ, 127
 Liber Tartarorum, 389
 libraries, monastery, 310
 library, Vatican, 323
 Libro d'oro, 368
 Liebig, x
 Liebnitz, 182
 life from horizontal, 313
 " simple, 279
 " "under the crozier", 310
 " values in, 309
 Lignamine, 250
 Ligorio, 146
 Linacre, x, xviii, 106, 116, 141, 142, 148, 203
 Lincoln Cathedral, 311,
 Linnaeus, 256 (Linné)
 Lipinska, Mdle., 129
 Lippi, Fra, Filippo, 14, 16, 18
 Lippi, Lippo, 12, 365
 Lisbon, 155
 Lister, 293
 "little ease", 198
 "little poor man of God", 315
 Livini, 261
 Livy, 76, 114
 Loggia Dei Lanzi, 27
 Loire, Chateaux, xii
 Lombard, Peter, xv, 80, 172, 227
 Lombardi, Antonio, 74
 Lombards, 373
 Lombroso, 200, 254, 285

INDEX

- London, 359
 Longroscino, 55
 Loredano, 246, 353
 Lorenzetti, Ambrogio, 12
 Lorenzo di Credi, 14
 Lorenzo de' Medici, 324
 Lorenzo The Magnificent, 324
 Loretto, Holy House at, 31
 L' Ospedale Maggiore, 370
 Lotto, Lorenzo, 19
 Louis IX, of France, Saint, 195, 315,
 321, 371
 " XIII, 181
 Louis the Pius, 373
 Louvre, 1,
 Lowell, J. R., 86
 Lucan, 114
 Lucas, E. V., 36
 Lucia di Lammermoor, 57
 Lucretius, 142, 165
 Lucri neglecti iurum, 246
 Luini, 370
 Luzzato, 261
- M
- Macaulay, 85
 Macchiavelli, xv, 90, 182, 362
 Madagascar, 385
 Madras, 319
 Magati, 305
 Magellan, 383
 Maggi, 300
 Magna Charta, 195
 Magnetica De Arte, 234
 Magnus, Albertus, 110, 174
 Mai, Angelo, S. J., 158
 Maiano Dante da, 81
 Mailapur, 390
 Maine, Sir Henry, vii, 164
 Mainz, 38
 Maioli, Thos., 66
 Malabar, 390
 malaria, 282
 Malebranche, 168
 Malgaigne, 272
 Malpighi, xviii, 248, 254, 268, 277,
 406
 Mandeville, 390
 Manetti, 137
 Manning, Cardinal, 3, 83
 Mantegna, xi, 18
 Mantua, 360, 373
 Manzolini, Madame, 130
 Manzoni, xiv, 94
 Maratta, Carlo, 20
 marble sewing, 403
 Marcellus theatre, 34
 March, Prof. 77
 Marco Polo, 368, 385
 Marconi, xvii, xxi, 236
 Margaret of Navarre, 154, 350
 Maria Theresa, 211
 Marino, 92
 Marliani, 146
 Marquis of Mantua, 351
 Mars rotation, 220
 Marseppini, 137
 Martino Simone di, 12
 Massachusetts Agricultural College,
 311
 Mascagni, 57
 Massaccio, xi
 Massaglia, 261
 Masters, The Four, 290
 Matilda of Canossa, 338
 Matilda Countess of Tuscany, 193
 materia prima, 227
 matter, indestructible, 228
 Matthews Brander, 36
 Matthioli, 274
 Maurice, F. D., 83, 171
 Maximilian II, 303
 Mary Queen of Scots, 329
 Mazzioti, 261
 Medici Cardinal de', 328
 " Cosimo de', 138
 " Giovanni de', 324
 " Lorenzo de', 142, 324
 medicine, Italian, 263
 " legal, 292
 " practice of, 195
 Medusa, Head of, 30
 Mellocello, Lancelotto, 393
 Melloni, xvi, xxi, 236
 Melozzo da Forli, xi
 Memmi, 12
 Memphis, 359
 Mendel, 283
 Menghini, 53
 mensuration, running water, 232
 Mercier, 184
 Mercuriade, 129
 Mercurialis, 250
 Merici, Angela, 131, 335
 Messina, 136
 meteorologico agricola, 229
 Mezzofanti, Cardinal, 161
 Michelangelo, viii, xi, xii, 28, 41, 50,
 151, 241, 349, 362, 370, 404
 Michelozzo, 139
 microscope, invention, 405
 Milan, 360, 369
 " Cathedral, 40, 158
 Milky Way, 218
 Millet, 6, 51
 Milman, Dean, 82
 Milton, v, xiii, 149
 Milvian Bridge, battle, 186
 Minerva, Church, 40, 344
 " temple, 2, 372
 Mino da Fiesole, 28
 missals, illuminated, 65
 Mistichelli, 253
 Molo vecchio, Genoa, 369
 Mommsen, 356
 Monaco, Prince of, 397
 Monastery, libraries, 310
 " service, 311
 monasticism, 98
 Mondino, 239

money, time, 326
 Mongolia, 388
 monks, Benedictine, 338
 monologium, 170
 Montagnana, 272
 Monte Carlo, 397
 Monte Cassino, 102, 126, 265
 Montecorvino, John of, 391
 Montelupo, 28
 Montessori, Madame, 117
 Monteverde, Claudio, 52
 More, Sir Thomas, 114, 142, 380
 Morel, 260
 Morgagni xviii, xxi, 242, 248, 259,
 278, 281, 282
 Morgan, J. Pierpont, 65
 Morris, William, 60, 66, 142, 412
 mosaic, 68
 Moses, Michelangelo, 29
 Müller, Johann, 316
 multiplication, invention, 212
 Mundinus, 239
 mundus subterraneus, 234
 municipalities, Italian, 362
 Murano, 19, 367
 Muratori, 157, 305
 Muretus, 145
 Murillo, xi
 Murphy button, anticipated, 298
 Murri, 254
 Museo, Borbonico, 376
 museum, Egypt, 396
 " South Kensington, 71, 374
 " Kircher, 110
 " Metropolitan, 69
 museums, church, 110
 music, terms, Italian, 46
 Musurgia, 234
 "mystics, prince of," 176

N

Nägeli, x
 Naldi, 275
 Nankin, 390
 Naples, 360
 Napoleon Code, 199, 380
 Napoleon Italian, 230
 Narcize, 373
 Narni, Erasmo da, 365
 "nations", 108
 "Nature abhors a vacuum", 407
 Nature in Dante, 215
 Navarro, an Italian, 286
 Nazarius, 186
 Nepos, 119
 Neri, see Philip Neri
 Neuburger, 241
 Newman, Cardinal, 83, 326
 New York Public Library, 42
 Nicaise, 129
 Nicholas IV, 392
 Nicholas V., Pope, 138, 140, 155
 Nicholas of Cusa, v, xvii, 116, 208,
 216, 280
 Nicolo of Brescia, 208

Nizzoli, 145
 Nobel Prize, 357
 Nobili, 236, 411
 Noli, Antonio de, 393
 Norma, 57
 North America, claims to, 382
 North Pole, 396
 Norton, Chas. Eliot, 85, 86
 Notker, 166
 Novaro xvii, 216
 Novum Organum, 84
 nunneries, Benedictine, 100, 122
 nuns, Benedictine, 100, 310, 338
 " English Benedictine, 354
 " in literature, 125
 "Nuremberg, Virgin of", 198

O

Occupation diseases, 286
 Oceanography, 397
 Ockenheim, 47 (Okenhem)
 Odoacer, 375
 Odoric of Pordenone, 389, 391
 O'Grady Standish, 187
 oligarchy, 363, 366
 Olyphant, Mrs., 346
 onomatology, xxii
 opera, buffa, 55
 " bouffe, 55
 " comic, 54, 410
 operas, xiv, 52
 Oraculum Septilingue, 353
 Oratorians, 327
 Oratorio, 52, 410
 Oratory, The Little, 327
 Orcagna, 12, 26
 Order Third, 315
 Orecchia, 261
 Orfeo, 52
 Orian, Father, 221
 Orkhon River, 388
 Or San Michele, 27
 Orsini, 146
 Orvieto, 3, 34, 372
 Osler, 273
 ostensoria, 67
 Ovid, 77, 114, 142
 Oxford, P., 105

P

Pacchionian bodies, 248
 Pacini, 248
 Paciolo, 207, 213
 Padua, 105, 186, 360
 " in law, 195
 Paestum, 376
 Pagel, 266
 Paginini, 59
 painting, Fresco, 404
 " oil, 404
 Paisello, 55
 Palestrina, 50, 329
 Palladino, 41, 377
 Pallavicini, Cardinal, 181

INDEX

- Palma Giovane, 20
 Palma Vecchio, 19
 Palmieri, 236
 Panaroli, 281
 Pandects, 197
 Pange Lingua, 177
 Pannine, Paolo, 20
 Pantheon, 34, 404
 Panvinio, 145
 Papal prestige, 331
 Paper, cotton, 413
 " Italian, 414
 Paphlagonians, 365
 Paradise Lost, 272
 Parathyroids, 260
 Paris, 105, 359
 " University of, 128
 Parma, 20, 325
 Parmigiano, 20
 Parron, Amadeo, 159
 Parthenon, 84
 Passage of Victor Emmanuel, 44
 Passaro, 305
 Pater Juris, 194
 Pater, Walter, 89
 Pathology, Father of Modern, 259
 Pathology, Italian, 269
 patricians, Venetian, 367
 Patrick, St., 121
 Patrizzi, 146
 Paul III, Pope, 131
 " V, Pope, 181
 " Saint, 187
 Paula, 121
 Pavia, Certosa of, 28, 351
 Pecetti, 305
 Pekin, 390, 392
 Pellico, Silvio, xiv, 95
 Pennsylvania Station, 42
 Pentaestheseion, 247
 Pepoli, 365
 Pergolese, 55
 Peri, 52
 Periclean age, 324
 Persius, 77
 Perugia, 3, 13, 34, 325, 360, 372
 Perugino, xi, 372
 Peruzzi Baldassare, 43, 409
 Pesaro, The Swan, 56
 Pestalozzi, 117
 Pests scrutinium, 281
 Petrarch, 88, 136, 150, 182, 357, 362
 Petronius, 250
 Pezzi, Domenico, 159
 Philae, 395
 Philip II, 147, 329
 " Father, 327
 " Neri, St., 51, 147, 326
 " Romolo, 326
 Phillippines, Indians of the, 323
 Phillips Wendell, 226, 401
 Philosophes, Les Grands, 183
 Philosophia Magnetica, 236
 " Universalis, 182
 Philosophiae, De Consolatione, 165
 Philosophy, Consolations of, 135
 " Italian, 252
 " scholastic, 177, 253
 physicians and apothecaries, 196
 Physick, Garden, 233
 Piacenza, 325
 Pianoforte, 58
 Piazzis, xvii, xxi, 221
 Piccini, 55
 Piccolomini, 249
 Pico della Mirandola, 142
 Piermarini, 44, 409
 Pieta, Michelangelo's, 29
 Pigafetti, 383
 Pilgrim's Progress, 272
 Pilon, Germain, 31
 Pindar, 114
 Pinturicchio, xi, 317
 Piombi, 368
 Piranesi, 157
 Pisa, 360, 376
 " Baptistry at, 25
 " Campo Santo, 68
 Pisan, Christine de, 345
 " Thos., de, 345
 Pisani, xi, 372
 Pisano, Andrea, 26
 " Giovanni, 25
 " Niccolo, 25
 Piscopia, Helen Lucretia Cornaro, 353
 Pissini, 277, 278
 Pitti, palace, 40
 Pius II, Pope, 140, 156
 " IV, Pope, 328
 Pizziccolli, 137
 Plain Chant, 43, 410
 planets, inhabitable, 219
 plants, sex in, 256
 " vascular system, 257
 Plantus, 76
 plasmodium malariae, 285
 Platina, 141
 Plato of Tivoli, 205, 214, 224
 Plattus, 159
 Plazzoni, 305
 "Pleasant House", 113
 Pleiades, 218
 Pliny, 76, 226, 401
 Plotinus, 142
 Plutarch, 114
 Poggendorf, 232
 poisonings in history, 353
 Politian, 137, 142
 polypharmacy, Arabian, 267, 284
 polyphony, 50
 Pompei Graffiti di, 160, 375, 400
 Pompeii, 62
 Pompey, 336
 Pompey's Theatre, 34
 pons Veroii, 243
 Poor Clares, 341
 Porta, Giovanni Battista della, 402
 Portinari Chapel, 370
 Portiuncula, 372
 Portugal, 155, 382

INDEX

- Portugal, Renaissance, 155
 postgraduate education, 270
 pottery, Etruscan, 400
 Poverello di Dio, 315
 "Poverty, the Lady, 313, 316
 practice, medical regulation, 195
 prescriptions, "calendar", 284
 " "gunshot", 284
 prestige, Papal, 331
 Priestley, 410
 "prime matter", 227
 Principe, II, 91
 Principia, 84
 Printer, The Inland, 412
 printing, inventions, 412
 " "Italian, 134
 prison debtors, 318
 propaganda, 323
 Propertius, 142, 145
 Proslogium, 170
 Prothetic dentistry, 400
 public art, 111
 Puccini, 57
 pulse, classification, 278
 " "clock, 280
 " "human, 408
 pulsilogium, 230
 Punch and Judy shows, 54
 Purbach, 215
 Purgatory, 348
 Puschmann, 244, 253, 277
 Puteoli, 376
 Putnam, Mrs. Emily Jas., 120, 125
 Pynsent, Abbess, 353
- Q
- Quintillian, 97, 143
- R
- Rabelais, 154
 Raffaele, 160
 Ramazzini, 287
 Ramsey, 106
 Raphael, xi, 3, 50
 " "cartoons, 71
 Ravenna, 5, 23, 35, 360, 374
 Raymond of Pennafort, 194
 Redi, biologist, poet, 93, 253
 Regimen sanitatis Salernitanum, 279
 Regiomontanus, v, xvii, 116, 216, 228
 Rembrandt, xi
 Renaissance, 136
 " "anatomists, 245
 " "cameos, 71
 " "earlier, 193
 " "explorers, 384
 " "gems, 71
 " "medicine, 279
 " "philosophy, 253
 " "Spanish, 154
 " "women, 334
 Renan, 314
 Renée of Anjou, 350
 Reni, Guido, 20, 364
- Resende, 155
 Reuchlin, v
 Riccardi, 139
 Ricci, 20
 Richardson, 271
 Richelieu, 181
 Rinuccini, 52
 Rivini, 248
 Robbia, Luca della, xii, 30, 68, 362
 " "terra cottas, 30
 Roberttelli, 145
 Robertson, 106
 Rocca Bartolomeo, 250
 Roger, 290
 " "of Sicily, 413
 Rolando, 248, 290
 Roma Sotteranea, 161
 Roman, aqueducts, 401
 " "cement, 401
 " "College, 115
 " "fever, 282
 " "matrons, 335
 " "mothers, 336
 " "tunnels, 401
 Romanesque, 36, 37
 " "architecture, 38
 Romano Giulio, xi
 Rome, 359, 136
 Romeo and Juliet, 377
 Roper, 106
 Rosa, Salvator, 20
 Rosmini, 160, 168, 171, 183
 Rospighi, 223
 Rosselli, 18
 Rossellini, 28
 Rossetti, Christian, 89
 " "Gabriel, 89
 " "W. H., 30, 89
 Rossi, 305
 Rossini, 55
 Rota, 278
 Rousseau, 92
 Rubens, xi
 Ruccellai, chapel, 7
 Ruffini, 248
 Rufinus, 169
 Ruggiero, 128, 290
 Ruini, 252
 Ruined Abbeys of Great Britain, 311
 Ryder, Father, 326
- S
- Sabatier, Paul, 314
 sabbath, rest, 192
 Sadoleto, 141
 St. Angelo, Castle, 34
 " "Gall Monastery of, 283
 " "Genevieve, Library of, 42
 " "John, J. A., 394
 " "John the Divine, 38
 " "Mark's, 5, 37
 " "Mary of the Springs, 345
 " "Peter's in Rome, 36, 84, 369, 404
 " "Peter Martyr Chapel, 370

INDEX

- Saintsbury, Prof., 78
 828 'εργασίαι αἱ 'ἰατρικαί,
 Salerno, xx, 102, 103, 126, 136, 265,
 334, 360, 376
 " Robt., Duke of, 266
 " school of, 128, 340
 Salo, 274
 Salvio, Alponso de, 231
 San Ambrosio, 370
 " Antonio, 366
 " Appolinare in Nuovo, 35
 " Carlo Theatre, 44, 370, 376, 409
 " Damiano, 372
 Sandstroem, 260
 Sandys, Prof., 113, 146, 148, 159
 San Francisco, Church of, 370
 " Lorenzo at Rome, 35
 San Marco, 15, 139
 " Martino at Lucca, 25
 " Maurizio, 370
 Sanmichele, 377
 Sanquirico, 261
 San Satiro, 370
 Santa Clara, 345
 " Croce, 40
 " Lucia, 376
 " Maria della Spina, 26
 " Maria Novella, 13
 " Sophia, 36
 Santini, 222
 Santorini, 248
 Santorio, 278, 280, 305
 " inventions, 280
 Santo Spirito Hospital, 320
 San Vitale, 35
 Sappho, 120
 Saracens, 274
 Sargent, 5, 63
 Sarpi Paolo, 252
 Sarto, Andrea del, 14
 Sassoferato, 20
 Saturn, planet, 218
 Savigny, 197
 Savonarola, 272, 296, 325, 326
 scaffolding, 404
 Scala, Can Grande della, 377
 Scale, musical, 409
 Scaligers, 154
 Scarlatti, 53
 Scarpa, 248
 "scavenger's daughter", 198
 Schaff, Philip, 167
 Scheiner, Christopher, 219
 Schelling, 182
 Schiapparelli, xvii, xxi
 Schliemann, 137
 scholarship, Italian, 134
 Scholastica, 99, 122, 338
 Schools, Bishops', 101
 " elementary, 101
 " Florence, 101
 " medical, at Salerno, 103
 " Sunday, 328
 " town, 101
 Schultheis, 249
 Schwan Chow, 390
 Schwann, Theodor, x
 science, Italian, 225
 sciences, biological, 238
 Sciolla, 261
 Scott, Sir Walter, 94
 Scotus, Duns, 110, 171
 Scribe, 94
 Scriptores Rei Rusticae, 143
 Scudder, Miss Vida, 344
 sculptors, Byzantine, 23
 sculpture, Roman, 22
 Scultetus, 249
 Secchi, xvii, 222
 seeds of disease living, 274
 Segonio, 145
 selection, natural, 175
 Selling, William, 156
 Seminar, 111
 Sentences, Book of, 172
 Sentences, Master of, xv
 Serlio, 43
 Servants of Relief for Incurable Can-
 cer, 345
 service, monastery, 311
 " public, 369
 " social, 366
 Settala, 305
 Seville, Cathedral of, 369
 sex in plants, 256
 Sforza, Lodovico, 370
 " Regent of Milan, 351
 Sgambati, 59
 Sgobbo, 261
 Shah Abbas, 394
 Shakespeare, xiii
 Sheldon, 109
 Short, 106
 Shot, experiments, 300
 Siam, 385
 Siberia, 385
 Sick Poor, Visiting Sisters of, 345
 Sidney, Sir Philip, 92
 Siena, 25, 343, 360
 Signorelli, x, 15
 Signoria, Piazza della, 27
 Silvatico, 305
 Singer, Dr. Chas., 274
 " Mrs. Dorothea, 274
 Sinigaglia, 325
 Sinsinawa, 345
 Sistine tapestries, 70
 Sixtus, iv, Pope, 141
 Societa Palatina, 157
 Society, Numismatic and Archaeological
 of N. Y., 380
 solstices, altitudes of the, 229
 Sordello, 31
 Scrutinium Pestis, 281
 South Kensington, 379
 " Museum, 374
 Spallanzani, Abbe xviii, xxi, 259, 354
 " Mariana, 355
 spectacles, invention, 402
 spectra of stars, 223

INDEX

- Spencer, Herbert, 174
 Speyer, 38
 Sphaerica of Theodosius, 205
 Spicilegium Romanum, 159
 Spiegelhel, 249
 Spigelius, 249
 Spinoza, 180, 182
 Squarcione, 366
 Stabat Mater, 49, 56, 77
 Stabiae, 376
 Statius, 142
 Stefano degli Angeli, 209
 Steno, v, x, xviii, 106, 153, 248, 253
 Stillman, W. J., 8, 15
 stones, precious, 71
 Strada, Father, S. J., 156, 236
 Stradella, 53
 Stradivari, 58, 410
 Stradivarius, 410
 Strambotto, 73
 Stubbs, Henry, 252
 students, English in Italy, 115
 " poor, 112
 substances, elementary, 228
 Sumatra, 385, 390
 Summa and Divine Comedy, 175
 Summa Codicis, 193
 sun spots, 223
 surgical instruments, Pompeii, 400
 " bed, 305
 surgery, xix
 " plastic, 297
 Sydenham, 264
 Symonds, John Addington, 182
 Symphony Society New York, 59
 Syon, catalogue, 124
 syphilis, 273
 T
 Tabriz, 391
 Tacitus, 82, 91, 165
 Tagliacozzi, 298, 302, 305
 Taj Mahal, 36
 "tales travellers", 396
 Tambroni, Clotilda, 355
 Tamurlane, 392
 Tantini, 59
 tapestries, Sistine, 70
 Tartaglia, 208
 Tartarorum Liber, 389
 Tartars, Book of, 389
 Tasso, xiii, 90, 340, 357
 teeth, filling of, with gold, 298
 telegraph, wireless, 411
 telescope, 231
 " invention of the, 405
 Telesio, xv, 146, 179, 230
 Tenebrae, 49
 Terence, 124, 142, 145, 159
 Teresa, St., 122
 text books of Kircher, 233
 texts scholarly, 143
 theatre, architecture; 42
 " La Scala, 44, 59, 370, 409
 " modern Italian, 409
 " San Carlo, 44, 370, 376, 409
 Theatro, Olympico, 43
 Thebes, 396
 Thebesio, 248
 Theodoric, xx, 265, 292, 293, 375
 Theodosius II, Emperor, 189
 " Sphaerica, 205
 therapeutics, Italian, 269
 thermo-electroscope, 411
 thermometer, 231, 408
 Thibet, 316, 385
 Thomas of Cantimprato, 79
 " Celano, 77
 Thompson, Gilman, 286
 Thoreau, 326
 Thorwaldsen, xii, 32
 Thucydides, 91
 Tibullus, 145, 155
 Tiburtinus, 205
 Tiepolo, 21
 Timbuctoo, 396
 time, money, 326
 Timurling, 392
 tin in dentistry, 298
 Tintoretto, xi, 19
 Tiptoft, John, 156
 Tiraboschi, S. J., Father, 158, 391
 Titian, xi, 19, 50, 74, 245, 367, 374
 Titianesque, 10
 Tizzoni, 260
 Tommasio, 250
 Tonti, Enrico, 383
 " and La Salle, 383
 Töply, 195
 Tordinoni, 43
 Toricelli, xvii, 209, 231, 407
 torpedo, Whitehead, 411
 Torre, Father di, 405
 torture, 198
 Toscanelli, xvii, 228
 Totila, 373
 town university, 365
 Tragus, 255
 Travelers, Lives of Celebrated, 394
 "travelers' tales", 396
 Traversari, 137
 Trent, Council of, 327
 trephining, 291
 Trevi, Fontana, v
 Trincavalla, 303
 Trocar and Canula anticipated, 304
 Trotula, 128
 Troubadours, 81
 Trouessart, 217
 Trovatore, 81
 trypanosomes, 286
 tuberculosis, contagious, 281
 Tufnel, 278
 tunnels, Roman, 401
 Tuscan of Siena, 344
 Twelve Tables, Laws of the, 400
 Tycho Brahe, 217
 type, Greek, 413
 " Hebrew, 413
 " Italic, 412

INDEX

U

Uffizzi, 40
 Ughetti, 260
 Uge of Lucca, xx, 292
 Unitarian Church, 328
 University, Bologna, 105
 " features, 107
 " first modern, 102
 " medieval, 108
 " Oxford, 105
 " Padua, 105, 195
 " Paris, 105, 195
 " Salerno, 376
 Ural mountains, 388
 Urban VIII, Pope, 181, 232
 Ursulines, 132
 Utopia, 380

V

Vacuum, 231
 Vacuum Torricellian, 232
 Valens, Emperor, 188
 Valentinian, 188, 189
 Vallauri, Masso, 159
 Valle, Pietro della, 393
 Vallisnieri, 259, 276, 281
 Valsalva, 248, 278
 values in life, 309
 Van der Weyden, 15
 Van Eyck, Jan., 15
 Vannucci, Pietro, 372
 Varolius, 245, 268
 Vasari, 17, 91, 92
 Vatican, 153
 " library, 140, 162, 323
 Venetians, 385
 Venice, 360, 366
 " stones of, 41
 Verazzano, 382
 Verde, Cape, Islands, 393
 Verdi, 56
 Vergerio, 137
 Verona, 377
 Veronese, xi, 19
 Verrochio, xii, 14, 28
 Vesalius, v, x, xviii, 106, 116, 153,
 241, 244, 273
 Velasquez, xi
 Vernier, 408
 Vespasiano da Bisticci, 138
 Vespucci, Amerigo, 379, 380
 Vesputius, 380
 Vesuvius, 226
 Vicenza, 377
 Vico, 198
 Victima Paschale, 49
 Victor III, Pope, 104
 Vida, 141
 Vidian Canal, 248
 Vierordt, 277
 Vigilantius, 169
 Vigo, 296

Villani, 101
 Vincent of Beauvais, 389
 Vincenzo di Rossi, 38
 Vinci, (see Leonardo)
 violin developed, 58
 Virchow, x, 271, 318, 336
 Virgil, 22, 76, 114, 136, 374, 375
 Visconti, 365
 Vita sobria, 279
 Vitelleschi, 115
 Vittoria Colonna, 349
 Vottorino da Feltre, 112, 130, 137,
 373
 Vivarinis, xi
 Vivianai, Vincenzo, 208
 vivum ex vivo, 281
 Vivaldi, Ugolino, 393
 Volta, xxi, xvii, 234
 Voltaic pile, 235, 411

W

Waldseemüller, 380
 Warham, Bishop, v
 Wenceslas, Emperor, xx
 West, Monks of the, 338
 Wharton, 242, 249
 wheelbarrow, invention, 403
 White, Pres., xx
 Whitehead, torpedo, 411
 William of Salicet, xx, 292, 293
 William Tell, 56
 Winckelmann, 23
 Windsor Castle, 70
 wireless, xvii
 Woman's sphere, ethical, 333
 Women, celibates, 123
 " Christian, 337
 " of Two Republics, 119
 " of Italian Renaissance, 334
 " religious, 126
 " students, Bologna, 130
 " under monasticism, 124
 " "worthy of eternal praise",
 340

Worcester, Earl of, 156
 World, garden of the, 311
 Worm, Olaus, 249
 wounds, gunshot, 300

X

Xenophon, 114

Y

Yarkand, 385
 Yeats, the Irish poet, 60
 Yule, Sir Henry, 388

Z

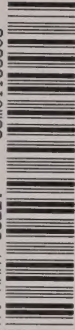
Zanda, 261
 Zanzibar, 385
 Zecchia, 305
 Zenone, 250
 Zuccherelli, 21

DATE DUE

945 W16

Walsh, James Joseph,

What civilization owes to Italy
MT. MARY COLL. ocm01163303



3 8920 99027214 3

Card 4

Walsh, James J
What civilization owes to Italy

DATE

ISSUED TO

RETURNED

DEC 12 1983

APR 03 1995

83-3
94-1068 MZM

117

945
W16

Walsh, James J.
What civilization owes to Italy.

The Patrick and Beatrice Haggerty
Library

Mount Mary College

Milwaukee, Wisconsin 53222

DEMCO

